GAS JOURNAL

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HOW SHOULD GAS AND COKE BE USED?

"DESPITE the competition of alternative sources of energy, we have every reason to believe that if the opportunity is tackled properly the demand for town gas and coke for the homes may so grow as to render the increases in output of past years relatively insignificant. It is important we take steps to inform ourselves what are likely to be the demands for our products. To some extent in the past development has been haphazard." We quote from a talk given by Dr. Harold Hartley, President of the Institution of Gas Engineers, at the Autumn Meeting of the North of England Gas Managers' Association.

It is for all to see that the demand for heat services in the home will grow rapidly. To appreciate this in a general sense is, however, insufficient. We must determine the purposes for which gas and coke should be used in the national interest. In this regard the leaders of the Gas Industry have an immediate responsibility which they must shoulder; on known facts and on trends of public opinion and community need and demand they must visualize and plan for the type of development in manufacture and utilization needed in, say, the next 20 years, so that all concerned—manufacturers of gas and coke and manufacturers of gas and coke using appliances—may be enabled to work co-operatively in common purpose. A major aspect of the problem is this: Is the Gas Industry going out for the heating of houses completely instead of some rooms intermittently, and if so does it propose to offer gas, or coke, or a combination of the two?

Rightly Dr. Hartley maintains that the Industry should fix targets after unbiased consideration of what *should* be done with gas rather than what *can* be done with gas. It does not follow that, because a desired result can be attained with a given source of energy, in the wider sense it is desirable to use the particular energy for that purpose. Constituent units of the Industry ought to know more precisely the fields to be covered. And we wholeheartedly endorse Dr. Hartley's contention—a contention he has voiced on more than one occasion publicly during his year of office as Institution President—that the Gas Industry requires not merely fact-finding committees, but a Policy Committee. The Institution should be in a position to guide the profession and indicate clearly the lines on which development should flow.

FUEL EFFICIENCY

THE history of coal is an epitome of the history of industry. Knowledge of scientific facts was not widespread when the industrial revolution started. It was given to very few to know even the most elementary scientific facts, and to still fewer to seek to apply them to industry. We do not suppose that Murdoch had any basic knowledge of the principles of coal carbonization, nor even that he discovered anything more than the fact that when heated in a closed vessel coal will give off an inflammable gas that can be collected and used for giving light. He did even *discover* that. It had been known for many years, but he turned it to practical effect. So in the dawn of the rise of British industry, the 18th century, men knew that combustibles would give heat when burnt, but very little more was known than that. The rest followed from trial and error, so that the saying grew and was elevated almost to the stature of a proverb that an ounce of practice is worth a ton of theory. In those days it was, because no one knew the theory. The pall of smoke that annoyed and disfigured London and other parts of the country when the industrial age commenced—and even centuries before—is evidence of the ignorance of the principles of combustion. Some there were who knew better; Count Rumford even in those far-off days was able to lay down the principles of combustion and of the design of heating appliances. He came near to the conception of calorific value and 150 years ago he devised a lime kiln in which there was a supply of secondary air under control for the prevention of smoke. He even estimated the efficiency with which fuel was used in those days and stated that it was about 12%. It is significant that last year Mr. Oliver Lyle estimated that coal is used in Britain to-day with an overall efficiency of 18%. In the efficiency with which fuel is used we have not progressed far since Rumford's time. In the diversity of uses to which heat is put, in the skill and knowledge with which heat is applied, in the development of industrial processes based on heat, our progress has been immense. But not so in the efficiency of use.

In his new book "Smoke," Mr. Arnold Marsh has said that "the first coal age (*i.e.*, the centuries that lie behind us) was entirely unscientific in its approach to coal, being reckless and primitive in its use of fuel and completely ignorant of its potentialities." There is only one way to change that state of affairs and it is by education. Bring people to understand the importance of fuel and to know the way to use fuel efficiently and they will soon apply that knowledge. It is a striking fact that the Regional Gas Engineering Advisory Boards found much to be improved, frequently due to lack of knowledge of the engineering and scientific facts. If that were so in the Gas Industry, how much the more likely is it to be true of other industries. The Ministry of Fuel and Power has saved through the work of its Fuel Efficiency Committee some 10,000,000 tons of coal a year without the installation of new plant on any scale. The country would be in a very bad plight to-day if those 10 million tons had gone up in smoke each year, wasted through bad technical handling.

Bitter Memories

It is worth considering the subject of coal and fuel efficiency a little more deeply. The consequences of being some 5 million tons of coal short last winter are well under-

stood and provoke bitter memories. The loss of £200,000,000 worth of exports as a consequence has been one of the causes of the present economic crisis. The 16 nations of Europe which have drawn up the plan for European recovery have agreed that coal is one of the foundations. *The Times* Diplomatic Correspondent wrote of that plan: "The great effort which this country must make towards her own and Europe's recovery was made plain. Coal is the basis of the effort. It is planned to raise output from 200,000,000 metric tons this year to 250,000,000 tons in 1951 —nearly 20,000,000 tons more than in 1939. Given a steady increase, coal exports to Europe would at last be resumed. It is hoped to begin with 6,000,000 tons in 1948, although none can be shipped before April; and in 1951 the total would be 29,000,000 tons. These exports will be one of our major contributions to the recovery of Europe." The recovery of Europe means our recovery also, since it is only by getting international trade going again that our own recovery can come about. Thus the well-being of Europe and of ourselves depends on British coal. What hope is there of getting this coal from increased production at the mines? To judge by the results to date, and by what appears to the unprejudiced observer to be a worsening of the relations between the National Coal Board and the miners, it seems pretty hopeless to expect any substantial increase on last year's figures. There is only one way to meet the situation and that is to use less coal ourselves. The increased use of gas and coke will materially assist in this. Carbonization is the most efficient way of using coal. A ton of raw coal when carbonized will go very much farther in the domestic appliance as coke and gas than it will when burnt as raw coal. In the interests of fuel economy, the only brake that should be put upon the replacement of coal by coke and gas is the carbonizing capacity of the gas-works and coke ovens. Some of the saving that will be necessary if we are to supply Europe can be achieved by this means.

Educating the Fuel Users

The rest must come from education of the fuel user. However modern his plant, he can still waste a lot of coal unless he is fully instructed in its correct use. The Fuel Efficiency Committee, among whose members is Dr. E. V. Evans, and its sub-committees, composed exclusively of industrialists of wide experience in the use of fuel who give their time without payment, have done much useful work in this direction. One of the first Committees to be set up was the Education Committee. This committee has organized technical education for engineers and managers, staff and firemen up and down the country for some six years past, and these classes and discussion groups have been attended by nearly 25,000 people. Hundreds of engineers and fuel technologists have given their spare time virtually free to instruct these men from industry, who in their turn have also given their time freely to be instructed. To get 25,000 grown men between the ages of 20 and 70 to go back to school again has been no small achievement; and the work still goes on. The textbook, "The Efficient Use of Fuel," has been written for them. Mr. Oliver Lyle is understood to be on the point of producing a companion volume, "The Efficient Use of Steam," of much the same size. Regional Joint Education Committees have been set up all over the country to organize education in fuel technology, the Ministry, the Institute of Fuel, and the Institution of Gas Engineers being participants. An "educational ladder" has been built whereby it is possible for those with the ability and the time and the perseverance to rise from the firing floor to Corporate Membership of the Institute of Fuel. In this work the City and Guilds of London Institute is playing no small part. The educational facilities of the country are being harnessed to the saving of fuel.

Another sub-committee to be set up early is that known as the Technical Committee. This body has devoted much of its efforts to the production of technical bulletins, and of these 51 have been produced. They have been written in a style that is suited to their readers, and these for the most part are the works engineers, the works foremen, and to some extent the works operatives. Occasionally an appendix is permitted in which the technical men may have their erudite say, but for the most part they are couched in simple practical language for the edification of those to whom simple practical facts make the greatest appeal. These bulletins go farther than to state what is known and common practice. In many directions, the best practice was not clearly established. It has been a function of the work of the Technical Committee to decide between conflicting schools of thought and to lay down what appears to be the best. Thus, these bulletins are not the usual type of official exhortation of which we are all more than a little tired, but represent for the busy works engineer a compendium of up-to-date practice that he cannot readily get elsewhere. As such they have an immense circulation not only to those firms that use large quantities of coal and get the bulletins automatically, but also to those thousands of people who would not regularly see them and have asked that their names be put on the mailing list.

We have described at some length what is being done because it appears to us that the saving of coal is vitally important at this juncture. In calling for more and yet more millions of tons of coal from our pits, the Government and the political authorities on the Continent behave as though British coal were inexhaustible. It is nothing of the sort. It is being exhausted at a rapid rate. We have enthused over the saving of 10,000,000 tons of coal a year through the fuel efficiency drive. Is this enough? The exact figure really does not matter. The fact is that we have as yet only scratched the surface.

Commentary by "Abaris"

"Streamlined"

A correspondent in your issue of Oct. 1 seeks respite, if not banishment, for the word "streamlined," and I am with him to the very "d." This adjective has had a hard life in recent years, and has been associated with, among other worldly objects, actresses, amphibia, rockets, wireless sets, cetacea, ships, and, of course, gas cookers. It will be agreed unanimously, I trust, that the word merits a rest.

But having expunged it from the scribe's dictionary, what other word of equal purport is there? May we use "svelte," or "harmonic" —just to be perverse? May we popularize the substitute "cleanlined," as suggested by your correspondent?

Here, then, we can commence a battle of words which will end up like a film magnate's *vade mecum*, in a tissue of glossy superlatives that, in time, will ring hollowly and mean precisely anything. Smooth, handsome, shapely, graceful, are all English words of some meaning, but with never the same appeal as the adjective under dispute. Slender and elegant are better applied to the feminine figure than to a gas cooker; but note that none of these words is a misleading upstart.

The "airflow" cooker would be reasonably adaptable but reminiscent of American car advertising; you know the sort of thing: "... the car that glides with a float-on-cloud-ease; the car you forget you are driving." Too far-fetched for the static cooker and too near to our correspondent's *bete noire;* so we abandon it.

The advertising fraternity with its verbal generosity spends a good deal of its time in the construction, cogitation, and application of words which they hope will catch on and be accepted as part and parcel of the product they set out to sell. It is a hard task with much perspiration and very little reward or gratitude; sometimes a zenith of delight; more often a nadir of despair.

After all, we seek only to produce and sell cookers that cook; cookers that are well designed, and cookers that please the feminine eye; in other words, good cookers.

These Exhibitions

It is a peculiarity of the human animal, particularly the female of the species, to derive a certain pleasure from hurting itself. Evidence of this failing may be found in the many women's exhibitions that have popped up all over the place during the past year, all showing the

flustered, exhausted, frustrated, but ever-eager housewife how she could "make do" with what she had got, if only she had something different.

The other day I went to see "Woman's Fair" at Dorland Hall and found that this exhibition cheerfully scorns the no doubt well-meant *motif* of the others in that it doesn't even try to be helpful. "Come," it cries, "look at what you cannot have. Come and have a good cry." Here I was privileged to see such noble contributions to our post-war world as a swimsuit that is also a corselette, and hair styles graced with such names as "Asymetrique" and "Esoteric." However, amid the frippery and frivolity, the mannequins, and the liquid Egyptian henna brighteners, the British Gas Council was showing an entertaining selection of films on a daylight sound projector. The films are "How to Read the Gas Meter," "The Obedient Flame," and "The Nation's Wealth." The finger of warning they raise receives support from a Ministry of Fuel and Power "Save Coal" exhibit. I looked at the blazing lights, ruminated on the labour expended, and walked sadly away.

It is Electrifying!

Slowly the temperatures are dropping, as, alas, Nature decrees they shall as winter approaches. Already many warnings have gone out from the power stations which, during the next few months, will be unable to cope with the demand for electricity.

To coincide with these first warnings the Central Electricity Board have released the information that they will build 31 new power stations, providing 10,000,000 kW. by 1952. This enormous programme is going to cost £450 million; and presumably this huge figure is to re-assure the public that they will be able to use electricity *ad libitum*, when all those dynamos are whirring; and to re-assure those who have electric cookers and heaters that their lot will be plausibly fair in some years' time. (Let me add, hurriedly, that the present output of the Grid is about 11,600,000 kW., so the new plans are pretty considerable.)

As for the present, I find little comfort in this news. On too many occasions has my wireless set lapsed into an awesome quietude; too often has my electric clock prevaricated or its mendacious little hands have been frozen stiff. The electricians had a plan for 1946, but this fell sadly in arrears because labour and materials were not abundant. The 1946 estimates provided for 1,000,000 kW. of new plant, but only about one-quarter of this was installed.

These shortages are no monopoly of the electricity suppliers, for we also suffer from the same disabilities, but, and this is the sad part, gas is not in the same political street as electricity; electricity has, for some queer reason, attracted the interest of national and municipal politicians, both of whom seem to regard the generation of electricity as a panacea for most of our ills. True, they now use electric therapy for some mental disorders, but the therapy that interests the housewife is that appertaining to her joints! Gas is too modest.

Hobbies

Hobbies, you will say, have nothing to do with gas making, and you will probably add that there must be many an engineer and manager who has not time for a hobby. Their work absorbs all their time; their lives are one long labour and hobby, all in one. In this I concur.

Most people require some form of recreation, not necessarily of a sporting or violent nature, for there are few humans who can go on day after day, year in, year out, without some form of mental relaxation. Such relaxation may be obtained in a thousand ways: by reading, dramatics, music, operatics, sewing, sketching, fretwork; yes, even by golf, which requires more or less effort, depending upon the proficiency of the wielder of drivers, mashies, and kindred weapons.

I do not want to cater for the higher organisms in the Industry, for they can think; what I should like to suggest is that we adopt in each gas undertaking a plan of campaign on the foundation of: "One man, one hobby." A creative hobby is one of the finest antidotes to mental flabbiness or physical inertia; and it can be the source of immense satisfaction and pride. A hobbies club, or an Arts and Crafts Society, call it by any name, as long as it gets moving, will be a boon if properly organized and sensibly run. Exhibitions, shows, and prizes appeal to most people. One has only to go to the nearest flower and vegetable show to see the manifest pleasure and pride some can take in exhibiting big, dropsical marrows and 18-in. runners. Not all men have gardens and allotments; most have a lot of spare time which is often frittered away sadly.

Man is a creator, a maker of things, but in modern times man is too apt to become a spectator, despite all his latent possibilities; his energy should be led into doing something satisfying. Play on those possibilities and you will help to create workers better equipped mentally for their jobs; and they will be happier workers.

Personal

Mr. C. H. ANGUS has been appointed to succeed the late E. G. Elliott as representative of the Davis Gas Stove Co., Ltd. (Radiation, Ltd.), in Scotland and the North of England.

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Mr. W. LAWSON HURDMAN, M.Sc., M.I.Mech.E., A.R.I.C., General Manager of the Parkinson Stove Co., Ltd., and Monitor Engineering and Oil Appliances, Ltd., has been appointed a Director of those Companies.

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Mr. D. RUSSELL ADAMS, Technical Assistant to the Cowdenbeath Gas Company for the past 16 months, has been appointed Assistant Distribution Superintendent of the Falkirk Gas Department and will take up his new duties next month.

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Mr. F. H. S. MCDAVID, C.A., has resigned from the Joint Managing Directorship of Brotherton and Co., Ltd., and from the Board of Directors. Mr. G. BREARLEY, B.Sc., F.R.I.C., M.I.Chem.E., has been appointed Managing Director, and Mr. G. BROTHERTON-RATCLIFFE, B.A., has joined the Board.

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Mr. A. W. EUSTACE has been appointed Commercial and Sales Manager of General Gas Appliances, Ltd. Since his return to the Company from the R.A.F. in January, 1946, Mr. Eustace has held the position of London Manager. He took up his new duties at the Works in Manchester on Oct. 1.

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At a special meeting of the British Ceramic Society on Oct. 6, Mr. A. T. GREEN, O.B.E. (Director of Research of the British Refractories Research Association and the British Pottery Research Association), was unanimously appointed to the office of Hon. General Secretary in succession to the late Dr. J. W. Mellor.

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Squadron-Leader R. H. MARKS, who since the end of the war has been a Director of an export company in London, has been appointed Assistant Secretary of the North Western Regional Office of the Federation of British Industries at Manchester. Squadron-Leader Marks takes the place of Mr. W. R. EADIE, now Secretary of the South Western Region of the F.B.I., at Bristol.

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Mr. JOSEPH NORRIS, Sales Superintendent of the Bolton Gas Department, has retired after 51 years' service. When he joined the Department in 1896 the whole of the fittings department turnover, including sales of fittings, meters, and wages totalled about £14,000 compared with the £48,000 turnover of to-day. He is an honorary member of Bolton Camera Club and was President for seven years.

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Miss ELIZABETH M. ROBERTSON, Laboratory Technical Assistant in the Perth Gas Department, is leaving next month to take up a post with the Dundee Gas Department. Miss Robertson, after gaining the Higher Leaving Certificate at Perth Academy, took up laboratory work at the gas-works in 1942 and has since been studying gas engineering at Dundee Technical College. As Secretary of the Scottish Junior Gas Association, she is the only woman to have held that position.

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With the opening meeting of the Illuminating Engineering Society on Oct. 14, Dr. J. W. T. WALSH took office as President for the 1947-48 session. This is the first time any member of the Society has been elected twice to the Presidential Chair, Dr. Walsh having been President in 1929. Dr. Walsh, who is Chairman of the National Illumination Committee of Great Britain and Principal Scientific Officer in the Light Division of the National Physical Laboratory, is the author of several works on illumination and photometry. His contributions to the art and science of illuminating engineering have been considerable, and he had also taken an active part in the development of education in the profession.

NEW MINISTER OF FUEL AND POWER

On Wednesday of last week changes in Government posts were announced from 10, Downing Street. Mr. Emanuel Shinwell was retired from the Cabinet and from his post as Minister of Fuel and Power. In his place as Minister, though without Cabinet Rank, Mr. H. T. N. Gaitskell has been appointed, with Mr. Alfred Robens as Parliamentary Secretary. Mr. Hugh Gaitskell, who acted as Parliamentary Secretary during the past 16 months, was educated at Winchester and New College, Oxford, and was a Reader in Political Economy in the University of London. During the war he was employed in the Ministry of Economic Warfare and at the Board of Trade. Mr. Robens is a former trade union official.

Letters to the Editor

Our Friend "Streamlined"

DEAR SIR,—The letter of Mr. A. Douglas Lacey in your issue of Oct. 1 is timely in drawing attention to the misuse of the word "streamlined" in relation to gas appliances.

When my Company introduced the "Renown" gas cooker to the Industry some 10 years ago, we referred to it as being a "clean line" cooker, and this phrase has been used in most of our advertisements relating to our cookers since that time.

The housewife is not interested in streamlining so far as her domestic appliances are concerned, but she is undoubtedly interested in appliances designed on lines which allow for easy cleaning.

Yours faithfully,

R. J. ROGERS,
Deputy Chairman.

Parkinson Stove Company, Ltd.
Stechford, Birmingham.
Oct. 8, 1947.

Merit and Remuneration

DEAR SIR,—May I congratulate you on calling attention to the lack of incentive to technologists in industry and the urgent need for a national campaign to increase the prestige of the technical professions. You express the hope that the Gas Industry will do whatever is necessary to encourage entrants into the higher technical branches as it is in need of a large influx of skilled scientific technical men, and with this hope the B.G.S.A. is in entire agreement.

I would suggest, however, that men with the necessary ability will avoid specialization in gas technology while the extremely low standard of remuneration which, in general, prevails throughout the Industry gives no adequate return for knowledge and experience acquired. Technical men and other non-manual grades have found it necessary, as you state, to organize themselves into associations to protect their interests, but I would point out that, in endeavouring to establish a scale of salaries which would attract into the Industry men of ability, such associations meet with unnecessary delays and, by procrastination, the employing bodies have so far avoided the issue. Although agreeing that the Government must, by the provision of adequate educational facilities, play a most important part in increasing the efficiency of industry, immediate steps can be taken by the Gas Industry to obtain the best staff available by serious consideration of an adequate scheme of remuneration. To continue to delay the implementation of such a scheme will accelerate the present trend of trained men to leave the Gas Industry to seek employment in the many other spheres where due regard is paid to ability and knowledge.

Yours faithfully,

F. C. HENFREY-SMITH,
General Secretary.

British Gas Staff Association,
12, Hall Drive, S.E.26.
Oct. 9, 1947.

High-Pressure Gasholders

DEAR SIR,—In your issue of Aug. 6 you reviewed our Paper "The High Pressure Gasholder." We would like at this distance of time to thank you for the wise and informed nature of your comments, but also perhaps we may call attention to certain misapprehensions which seem widespread and to which you have in some degree lent support.

With you we regret the bitter controversy which seems inevitable once welding is mentioned as an alternative to riveting. It is a pity that discussion of these alternative methods of construction cannot be conducted objectively and in the light of known facts. Having in mind the blind advocacy which so often attaches to the use of welding, we were at pains to show up its potential weaknesses as well as its strengths, and we have been disappointed to find our Paper being used for the round condemnation of welding.

The following observations may help to re-establish a true perspective:

1. The aim of our Paper was to indicate the lines upon which appropriate standards and stresses might be decided. Our consideration of riveting was brief, not because it is unsuitable or out of date, but because as an art it is well established. We deemed a more lengthy consideration of welding necessary because welded gasholders are not yet the subject of published codes of practice. To indicate, as we did, the potential weaknesses of welding and to suggest safeguards is not to condemn it.

2. Riveting also has its weaknesses. The Home Office Regulations and the codes of the Insurance Offices were made necessary by repeated failures of riveted vessels due mainly to the inability of inspectors to detect faulty materials or workmanship, or because designers did not allow for such defects. If riveting was a new art modern inspection methods would undoubtedly include X-ray examination of riveted joints. Present-day technique is thought to be satisfactory without such examination because during a century of experience there has been built up a considerable body of knowledge, largely empirical, upon which codes of practice may be satisfactorily based.

3. The growth of welding has, however, coincided with the introduction of X-ray examination and an increasing knowledge of metals and of their behaviour under stress. It is thus possible and desirable to subject welding to far more searching examination and analysis than was possible in the early days of riveting, and to ensure that weld soundness is achieved scientifically rather than as the result of facts brought to light by disastrous failures.

4. The cost of X-ray examination of welded joints whether in the shop or at site is not in itself great. It is the rectification of joints shown to be unsound that may be expensive. Surely expenditure in this way is preferable to the blind acceptance of the unknown.

5. It is true that X-ray examination does not show every imperfection of a welded joint. The imperfections undisclosed may, however, be less serious than those accepted in riveted joints. The undisclosed presence of "locked up" stresses is recognized and allowed for in the joint efficiency.

6. We confirm that hammer treatment of welds, originating in America, is now regarded there as inappropriate and dangerous. We think it is unwise to consider it as a treatment to be advocated here.

7. Welding has superseded riveting in many fields. We gave as one only of the reasons for its consideration for pressure holders the fact that riveters able to do boiler quality work are decreasing in numbers. We are aware that such riveters still exist, but few young men have entered the trade during the last 20 years, many older men have left it, and there are few boiler standard riveters under 40 years of age. *These facts explain what is common knowledge, that the trade is a dying one.* We doubt if there is a continuing volume of work to encourage employers to train riveters or to make young men wish to enter the trade.

8. We are not aware of any failures of welded pressure vessels in this country. We think there has been none.

9. The hazards of air testing arise from the compressibility of air and apply to every form of construction, welding, riveting, or even solid forging. It is our view, supported by that of the leading Insurance Companies, that to air-test pressure holders has been an error of judgment and that hydraulic testing should be universal, as it is with steam boilers and all other pressure vessels.

This recommendation does not, as you in your review suggest, invalidate welding; on the contrary, it is made in the light of the possibility of a failure arising at rivet, weld, or even in the plate itself.

In this connexion you will recall that the large riveted pressure holder inspected by members of the Institution at Birmingham had been hydraulically tested. Had an air test been used we doubt if anyone would have considered a test pressure more than 10% above design pressure, and even so the hazards would have been enormous.

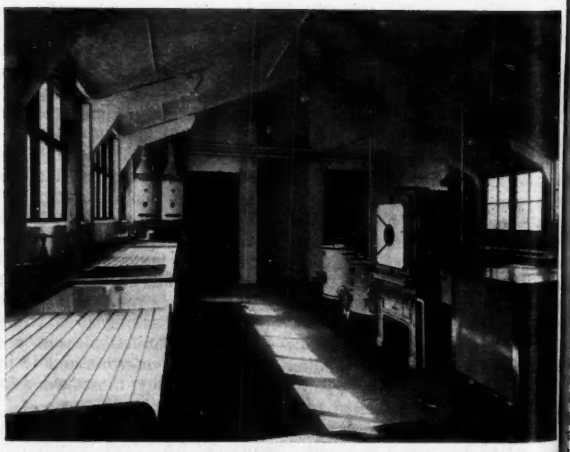
Yours faithfully,

M. NOONE,
A. G. GRANT.

Whessoe, Ltd.
Darlington.
Oct. 9, 1947.

ALL GAS SCHOOL KITCHEN

A new all-gas kitchen has just been installed at Owen's School, Islington, London. This up-to-date installation is well laid out in a kitchen built specially on to the school—part of which was damaged during the war.



A double oven range, large hot closet, two 30 gall. boiling pans, large steamer, two Ascot multi-points, and a gas-heated sink make up the equipment, which is rounded off by a potato peeler.

News in Brief

Ascot Gas Water Heaters, Ltd., had a well laid out stand at the Midland Ideal Homes Exhibition, which drew large crowds in Birmingham.

Improvements and Replacements at Motherwell and Wishaw gas-works of coal bunkers and screening plant at a cost of £17,049 have been approved by the Town Council.

Blackburn Gas Department's Technical and Clerical Staff is to be re-organized to meet present and future needs. The post of Works Superintendent has been altered to Works Manager and the staff increased by four Shift Engineers and various clerks.

Nelson Town Council has applied to the Minister of Fuel and Power for approval of replacing carburetted water gas plant and holder at Brierfield gas-works, and purchase of a 60 h.p. Diesel locomotive for the gas-works. For reconstructing a bed of retorts the tender of Wests Gas Improvement Co., Ltd., was accepted.

In the Ashton-under-Lyne Centenary Pageant the Stalybridge Gas Department's service van won the second prize in the class for the best kept vehicle. The van is an Austin 10 painted maroon and black with a gas flame on each side and the words " Gas Service " underneath in a chevron.

Aberfeldy Gas Light Company has decided to ask the Ministry of Fuel and Power for permission to increase the price of gas from 5s. 5d. to 6s. 8d. per 1,000 cu.ft. It was stated at the annual meeting that working costs amounted to nearly £2,000 over the previous year. The Ministry had sanctioned expenditure of £3,500 on improvements at the gas-works, and offers had been accepted. This year's dividend is 5%.

Rothbury Gas Light Company, Northumberland, has gone into liquidation as a result of financial difficulties and worn-out plant. The Company has 250 consumers and the decision to go into liquidation was taken at a meeting of the members and the creditors. Supplies of gas to consumers in the area will continue only while the present amount of fuel lasts, which will be only a few weeks. The Secretary of the Company is Mr. Robert Winn, of Newcastle-on-Tyne.

Councillor Martin, Vice-Convenor of the Greenock Gas Department, inaugurated a series of cookery demonstrations in the Demonstration Theatre of the Gas Showroom on Sept. 23. He emphasized that the demonstrations were specially devised to assist housewives to make the most of available materials and to use gas for cooking in the most economical manner. The demonstrations were provided by Messrs. Alfred Bird & Sons, Ltd., in conjunction with the Gas Department, and were attended by about 1,000 housewives.

Under the Fertilizers (Prices) Order, 1947 (S.R. and O. No. 2,113), made by the Board of Trade, the standard and maximum prices for certain fertilizers are increased as from Oct. 4, as follows, to cover additional transport charges. In Great Britain and delivered farmers' nearest railway station: Sulphate of ammonia, by 5s. ton.; basic slag, by 3s. ton; National Compounds, by 3s. ton; C.C.F.'s, by 8s. ton; ground phosphate, by 3s. ton; superphosphate, by 3s. ton. In Northern Ireland. Ex " port place " or producer's works: Sulphate of ammonia, by 5s. ton; basic slag, by 3s. ton; superphosphate, by 3s. ton. Copies of the Order, which also consolidates the Control of Fertilizers Orders Nos. 31, 33, and 35, may be obtained from H.M. Stationery Office or any bookseller, price 3d.

Important Changes in the Law affecting industrial concerns, including the coming into force of the new scheme of national insurance next year, the control of engagement, and the staggering of working hours, give special interest to the Industrial Welfare Society's postal course in Industrial Law, which has now been successfully conducted for some years. The course consists of seven lectures which are constantly reviewed so as to be up to date, and covers the whole field of employment and factory law, with which management and executives in industry are concerned. Particulars of the course can be obtained on application to the Secretary, Industrial Welfare Society, 14, Hobart Place, Westminster, London, S.W.1.

First Prize in a carnival procession organized by the Camberwell Borough Council in support of the National Savings Committee's Silver Lining Campaign was awarded to the South Metropolitan Gas Company for an attractively decorated vehicle with the theme " Gas is Always There." One side of the vehicle depicted the service of gas in the home, and the other its applications in industry. Pictures surrounding the van were all hand-painted in colour. Exhibits on the home side included a De La Rue water heater, a cream FA-Neat portable heater, a prototype gas cooker in blue, an Ascot sink heater, and a cream washing machine, from the wringer of which a line of washing extended. A young lady sitting in an arm-chair reading suggested that gas gave her ample leisure. The industrial side was covered by a fish fryer, an infra-red stoving oven, a muffle furnace, and a sugar boiler.

Prices of Lead Pipes and Sheets have been raised a further 15s. a ton, for home delivery, with pipes now quoted at £109 15s. and sheets at £108 10s. ton, less 2½%.

Lincoln Gas Department's Works, considered to be among the finest in the country, has been inspected by visitors from Brighton, Bristol, Hornsey, Bolton, Stockton-on-Tees, Newark, Halifax, Tipton, Harrogate, York, and France.

The General Post Office continues to receive many complaints from Continental recipients of letters from Great Britain that their correspondence is underpaid. The minimum postage of letters to foreign countries in Europe is 3d.

Chile produced 1,602,063 metric tons of nitrate during the year ended June 30, 1947, compared with 1,603,820 metric tons in 1945-46, the Nitrate and Iodine Sales Corporation announces. Exports in 1946-47 were 1,571,898 tons (1,614,615).

Mr. M. L. G. Balfour has been appointed Chief Information Officer Board of Trade. His duties will include those previously performed by the Director of Public Relations and he will also supervise Overseas Information activities which will continue to be directed by Mr. R. K. Bacon.

Under Their Scheme of weekly contribution to the leading charities in Edinburgh the employees of Alder & Mackay, Ltd., have made the following contributions: Edinburgh Royal Infirmary £206 13s. 11d., Sick Children's Hospital £39 8s. 11d., Queen's Institute of District Nursing £73 8s. 8d—a total of £319 11s. 6d.

The Society of Instrument Technology will hold a meeting on Oct. 28, at 7 p.m. when a Paper on " The Organization of an Instrument Department in an Industrial Works " will be presented by J. O. V. Vick, C. Lamond, and W. Lindsay. The meeting, to which visitors will be welcomed, will be held at the Royal Society of Tropical Medicine and Hygiene, Manson House, Portland Place, London, W.1.

Diary

Oct. 16—Institute of Fuel: Melchett Lecture by Major Kenneth Gordon, C.B.E., " Hydrogenation in the Fuel and Chemical Industries." Gas Industry House, 2.30 p.m.

Oct. 16.—Midland Association of Gas Engineers and Managers: Autumn Meeting, King Edward House, New Street, Birmingham, 2.30 p.m. Films: " The Erection of the Rainbow Bridge at Niagara Falls " and " The Failure of the Tacoma Narrows Bridge."

Oct. 17.—Scottish Junior Gas Association (Western District): Royal Technical College, Glasgow, 5 p.m. Presidential Address of D. M. Rowan.

Oct. 18.—Manchester and District Junior Gas Association: Visit to Distribution Control Room and Garston works of the Liverpool Gas Company. Meeting at Radiant House. Presidential Address of F. Bell.

Oct. 20.—London and Counties Coke Association: Finance Committee, 10.30 a.m. Executive Committee, 11 a.m. Central Committee, 11.45 a.m. Annual Luncheon, 1 for 1.15 p.m. Annual General Meeting, 2.45 p.m. Grosvenor House, Park Lane, W.1.

Oct. 24.—Women's Gas Council: Liverpool Gas Company, 2.30 p.m. Address by R. J. Gregg, Sales Manager, Ascot Gas Water Heaters, Ltd.

Oct. 28.—Southern Association of Gas Engineers and Managers: Annual General Meeting, Connaught Rooms, Kingsway, London. 2.30 p.m. (Council Meeting, 11 a.m.)

Oct. 31.—Manchester District Association of Gas Engineers: Autumn Meeting. " Four Years' Developments at Preston," A. K. Collinge. Midland Hotel, Manchester.

Nov. 8.—Institution of Chemical Engineers: " Modern Tar Distillation Plants," A. L. Curtis. College of Technology, Manchester, 3 p.m.

Nov. 11.—Institution of Chemical Engineers: " The Purification of Gases in Low Temperature Processes," T. A. Hall and G. G. Haselden. Apartments of the Geological Society, Burlington House, 5.30 p.m.

Nov. 12.—B.G.C. Domestic Development Committee, Gas Industry House, 2.30 p.m.

Nov. 25-26.—Institution of Gas Engineers: 13th Autumn Research Meeting, London.

Nov. 27.—Southern Association of Gas Engineers and Managers (Eastern District): " Some Aspects of Distribution Work," Lieut.-Colonel J. A. Gould. Gas Industry House, 2.30 p.m.

CODES OF PRACTICE FOR THE GAS INDUSTRY

The final issue of 10 codes of practice for the Gas Industry was launched at Gas Industry House on Friday last by the Minister of Works, Mr. C. W. Key, M.P. The codes—involving an immense amount of work—have been prepared by a Committee convened by the Institution of Gas Engineers on behalf of the Codes of Practice Committee of the Ministry, set up in 1942 with the support of the Minister of Health and the principal professional institutions in the building and civil engineering industries. Throughout the British Standards Institution has been associated with the work. The I.G.E. Code Committee is under the Chairmanship of Lieut.-Col. F. J. Bywater, M.C., and further codes are in preparation. As pointed out by the President of the Institution, Dr. Harold Hartley, the Gas Industry has acted with exemplary speed in setting country-wide standards of practice. It would be difficult to exaggerate the value of the work, and thanks are certainly due to all who have made possible the issue of the Codes. The makers of plant and appliances have given their full collaboration and have had representation on the Committee and its Drafting Panels; and there has been consultation at every stage in the preparation of the Codes with the representatives of the Gas Industry in Scotland to ensure that the Codes should meet the requirements of Scottish practice.

THE Minister of Works, introducing the codes, said they were specifications or operative documents designed to contain the best available standard of advice and guidance on the selection, use, and assembly of materials in every phase connected with the construction and equipment of buildings, having full regard to the needs of efficiency and of economy of labour. "Codes of Practice," he added, "do not contemplate any invasion into the field of the designer. They are produced as the recommended good practice and are not mandatory." He continued: "The difficulty of the task is indicated by the fact that some four or five years or even longer normally elapses between the inception of a code and its final publication, the time being taken up in collecting and collating information from all the most reliable sources and putting it together in such a form that it may be of universal use after reconciling differences of opinion among experts and submitting the draft codes to comment in every informed quarter. Sometimes the results of this exploration of all British and foreign practice brings to light the need for research before a satisfactory code can be evolved. We are presenting to-day a series of codes belonging to the Installations group of the Building series of codes and produced by a Committee convened by the Institution of Gas Engineers. These codes will be widely used throughout the Gas Industry of Great Britain and will be closely studied abroad. I am not exaggerating when I say they will add materially to the efficiency of the installation of gas equipment in buildings. They deal comprehensively with the installations required so that gas can be delivered from a main to the appliances most generally used in single family dwellings and give full guidance on the selection and assembly of appliances according to various needs.

"My friends in the Industry will not mind my reminding them that they found many diversities of practice in installations up and down the country when preparing these codes and that the task itself was enlightening to them in that it showed how often economies and added efficiency could be achieved by a reasonable degree of standardization and uniformity in practice. You will note the high degree of technical detail in these codes and you will wonder how this has been achieved with so great a degree of unanimity among experts. The task of reconciling differences of opinion among the experts has been the responsibility of the Institution Committees and in this they have received such assistance as they needed from a very small technical and administrative staff in my own Ministry and from the highly skilled technical staffs in various branches of the Department of Scientific and Industrial Research, of which the Building Research Station and Fuel Research Station have been in the closest constant touch with the Institution."

The Codes in Summary

The first four codes make recommendations concerning the selection and fitment of all the installations required before gas can be delivered from a main to an appliance in a building, and the remainder deal with appliances which would normally be installed in a single family dwelling.

Code 331.101, "Gas service pipes," describes the methods of laying service pipes and their entry into buildings. It also makes recommendations concerning the choice of pipe sizes; protection against corrosion; excavation; pipe jointing; the use of service valves and other appliances. The precautions to be taken when a number of services are run in close proximity to one another are given in an Appendix.

Code 331.102, "Gas metering and consumer's control," deals with the provision, siting, and fixing of meters, controls, governors, and connexions. The dimensions and capacity are given for various meters and, for the meters normally used in small premises, dimensions of a recommended meter compartment are provided, together with advice on siting the compartment.

Code 331.103, "Gas installation pipes," is concerned with the internal pipe systems for gas, and is applicable to all classes of buildings. Recommendations are given as to suitable materials for pipes and fittings; pipe joints and jointing compounds; pipe supports and fixings; cocks and valves; and as to the method to be adopted in testing installation pipe systems in new property. Special recommendations are made in an Appendix to meet the particular requirements of certain educational establishments and a table is provided showing sizes of pipes with their capacities in cubic feet per hour for various lengths. The effect of inserting elbows, tees, &c., in a run of pipe is expressed in terms of additional length of pipe.

Code 331.104, "Flues for gas appliances," relates to the choice and installation of any flue to which a gas-fired appliance (other than industrial appliances) may be fitted. It includes flues primarily designed to remove products of combustion and flues which are designed not only to remove products of combustion, but also to give adequate ventilation in a room. These flues may either be an integral part of the building or additional to it. It also includes flues originally intended for solid fuel burning appliances into which gas burning appliances may be vented. Since, in certain circumstances, some appliances can be operated without flues, a list is provided showing under what conditions the use of a flue becomes necessary. Reference is made to the components and suitable materials to be used in flue construction. The minimum areas to be used for flues for gas fires and water heaters, to give ventilation as well as to remove diluted products of combustion, are tabulated. Other sections of the code refer to the terminal position of flues; factors in avoiding condensation; connexion of flue pipes to gas appliances; fire precautions; precautions to be taken when connecting appliances to existing flues and canopy or hood ventilation for large scale cooking equipment. Diagrams are included to supplement the text of the code.

Code 332.101, "Gas lighting—single family dwellings," covers the methods and installations for achieving adequate standards of lighting for dwellings. A table is provided showing the sizes of light source usually used and their approximate output. The illumination necessary to meet the lighting requirements for living rooms, bedrooms, kitchens and sculleries, and stairs and passages is set out in alternative schemes for various sizes of room. A further table sets out the type and number of burners required for both direct and general illumination for various room areas.

Code 332.201, "Domestic hot water supply by gas (single family dwellings)," deals with both instantaneous water heaters and storage water heaters. It sets out the conditions under which the various types of installation are best used and lists the ancillary equipment required to complete the installation. Tables are provided showing the maximum recommended lengths of draw-off pipes; heat losses from pipes and tanks, spacing for supports for iron, heavy gauge copper and mild steel pipes; the Appendices show in table form types of instantaneous and storage water heaters, their gas consumption, water output, and other special features. Examples of installations are given in the illustrations.

Code 332.301, "Space heating by means of independent gas appliances," relates to the selection and installation of independent appliances as distinct from central heating systems. It is assumed that the rooms which are to be heated are ventilated with 1½ to 2½ air changes per hour. Tables show heat insulation standards; the heat required to maintain certain defined conditions and the characteristics of the principal and alternative or supplementary heating appliances. Detailed recommendations are made concerning the fitting of various types of fire and methods of connecting flue outlets to chimneys are illustrated.

Code 332.401, "Gas cooking installations for single family dwellings," deals with the selection and installation of gas cooking appliances. Information is set out dealing with types of cookers, siting and space required; capacity; ventilation, and fire precautions. Examples of various types of cookers are illustrated in an Appendix.

Code 332.501, "Gas operated refrigerators," deals with the selection and installation of gas refrigerators for food storage. Information is given on certain points to be borne in mind in the use and placing of both free-standing and inset refrigerators, and a Table is given showing the capacity and dimensions of refrigerators suitable for various sizes of household.

Code 332.601, "Installation of gas heating appliances for laundering and ancillary domestic purposes," deals with the miscellaneous domestic gas heated appliances such as wash-boilers, washing machines (including types heated by gas and operated by hand or electricity), drying and airing cabinets, airing cupboard heaters, burners for ignition of solid fuel, small portable gas appliances such as boiling burners, irons, pokers, grillers, kettles, &c. Information is given on fixing flexible pipes and connexions and desirable points of design in respect of the appliances enumerated above. As these appliances will in the main be served by flexible piping, various types of socket outlets for flexible pipe connexions are described and illustrated in detail. A method of testing the efficiency of drying cabinets is given in an Appendix.

Copies of the codes may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, at the following prices: Code 332.201 at 3s., and the remainder at 2s. each, post free.

W.G.C. ON MERSEYSIDE

Formed just over a year ago, the Merseyside Branch of the Women's Gas Council started the present winter session with a membership of 225 and a further increase in numbers is expected as a result of the Homecraft Course which began on Oct. 1. Two complete courses were held last winter, and during the summer parties of members visited various places of interest, and representatives attended the annual meeting of the Women's Gas Council in London.

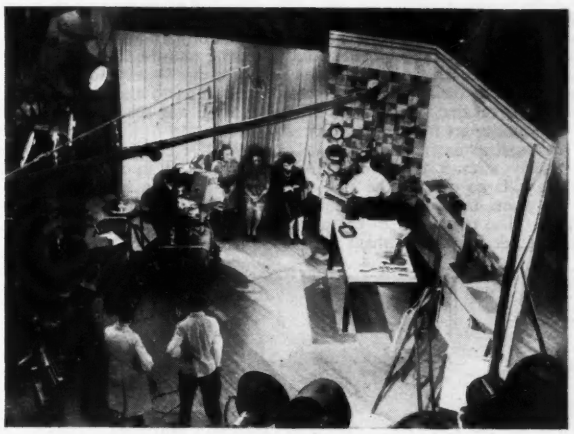
During the autumn a very successful competition and exhibition of members' work was held to inaugurate the third Homecraft Course. The present course follows fairly closely the lines of the two previous courses. The first Wednesday afternoon in each month has been developed into the main monthly meeting of the Merseyside Branch of the Women's Gas Council. The subjects chosen for the 10 classes comprise fuel economy, care and valeting of clothing, choice and storage of food, water heating, feeding the family, beauty, making the most of the cooker, home nursing, entertaining at home, and the story of wool. The large number of enrolments received for the present course includes a satisfactory proportion of new members.

EFFICIENCY AT OLYMPIA

That there is no limit to human ingenuity was surely the opinion of visitors to the Business Efficiency Exhibition, held in the Empire Hall of Olympia from Oct. 1-11. Organized by the Office Appliance Trades Association, this exhibition, the first of its kind since 1938, filled its 38,000 sq.ft. of floorspace with a display of concentrated efficiency difficult to comprehend without careful examination. Machines checked banknotes, counted coins, sealed 20,000 envelopes per hour, tabulated 600 cards per minute, fed, printed and cut 9,000 labels per hour, and performed many similar feats with apparent ease, and even quietness. Not the least remarkable was an "autotypist" which did a minimum of 200 letters per day, writing at the rate of 125 words per minute, the date and address being manually typed in through the same ribbon and by the same keys before the machine produced the letter proper.

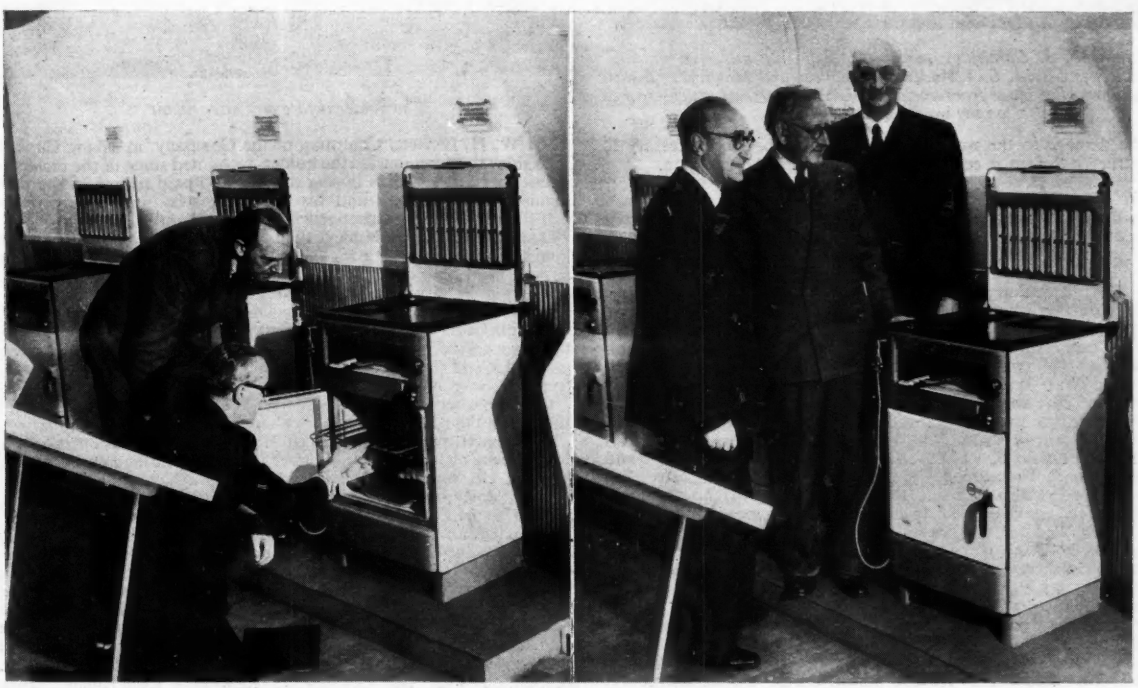
These were the exhibits marked by curiosity; of the more normal type of office equipment there was abundance. The well-known products of Roneo, Ltd., were displayed to advantage and many applications of their visible card record system were demonstrated. Also prominent was the punched card system evolved by Powers-Samas Accounting Machines, Ltd., which enables a great variety of information to be recorded, sorted, and analyzed in a minimum of time. An excellent device for copying up to 300 facsimile copies at a single writing or typing was the "Fordigraph," manufactured by Frank R. Ford, Ltd.; this should prove useful to smaller organizations. For those requiring their letters either opened or sealed, the International Coin Counting Machine Co., Ltd., exhibited machines for these purposes, as well as ingenious coin counting and packeting devices.

COOKERY BY TELEVISION



Four housewives watch a demonstration of low temperature cookery given by Phillip Harben, the B.B.C. television cook. This unusual picture by a British Gas Council staff photographer was taken during the actual demonstration at the television studio at Radiolympia

INAUGURATION OF NEW GAS COOKER



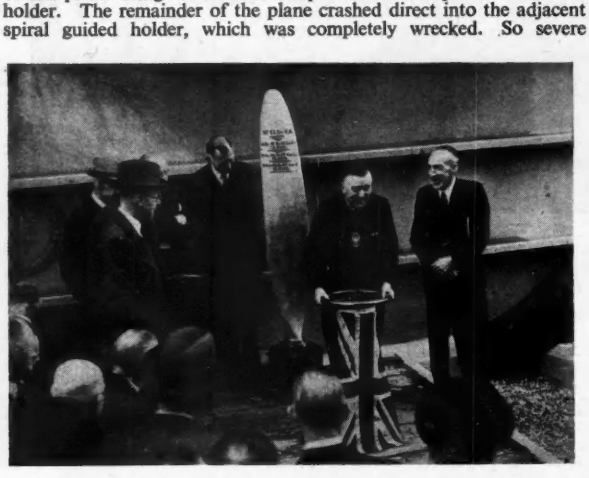
In last week's "JOURNAL" we gave an illustrated description of the latest New World Cooker, No. 1430. The cooker was inaugurated by the Minister of Works, Alderman C. W. Key, M.P., on Monday, Oct. 6. Our photographs, taken at the opening ceremony, show (right) Mr. E. A. Seal (Director of Bulding Material), the Minister of Works, and Mr. J. F. Davies (Chairman, Radiation, Ltd.). The photograph on the left shows the "Gas Journal" and the "Gas World" examining the new cooker

RECONSTRUCTED WATERLESS HOLDER AT BOGNOR REGIS

THE one million cu.ft. M.A.N. waterless holder at Bognor Regis —built by R. and J. Dempster, Ltd., in 1932, emptied under Government instructions on the outbreak of war, repeatedly damaged by enemy action, and ultimately reconstructed by the original contractors—was ceremonially re-inaugurated on Oct. 8, when at the invitation of Mr. W. H. Bennett, Chairman of the Bognor Regis and Electricity Company, Captain W. J. Corbishley, Chairman of the Bognor Regis Urban District Council, opened a valve to raise the pressure in the holder.

In September, 1942, a high explosive bomb struck the holder at piston level, damaging one bay of the piston, and was deflected diagonally upwards through the holder, passing out about half way up on the opposite side of the holder shell and finally exploding on a bridge outside the works, with disastrous results to the bridge, but fortunately on that occasion no serious damage was sustained by any of the plant apart from the waterless holder.

The most extensive damage was caused in December, 1942, when an enemy aircraft disabled by A.A. fire crashed into the holder, tearing a large rent in the side sheeting, one engine and one wing of the plane being torn off and deposited on the piston inside the holder. The remainder of the plane crashed direct into the adjacent spiral guided holder, which was completely wrecked. So severe was the damage to the waterless holder that it became necessary to reconstruct it before it could again be placed in commission.



Captain W. J. Corbishley inaugurating the reconstructed holder. On his left is Mr. A. G. I. Anderson, Engineer and Manager. Behind him is a propeller blade from one of the German aircraft which crashed on the works during the war

Details of Renewals

The damaged parts which required to be renewed or repaired included:

Renewed: Eight main stanchions; 70 flanged shell plates; eight bays of No. 1 balcony; two flights of outer staircase, one bay of piston seal trough; three flanged piston plates; bracings in roof and piston; roof felting; glas windows; canvas seal; sealing medium; and three main tar supply pipes. Dismantled, straightened, and refixed: Two flights of outer staircase. Dismantled, rebuilt at Manchester, and refixed: Two flights of internal staircase. Special patches designed and welded on: 193 ragged cannon and bullet holes. New insertions: Timber roof covering.

The hole in the shell was of such a size that 10 in. by 8 in. R.S. joists in the form of struts were temporarily fixed across the gap to prevent further distortion of the shell until the necessary repairs could be undertaken. The damage to the piston was not extensive, but entailed considerable repair and renewal, including a new section of seal trough, the whole of the canvas seal, and the removal and renewal of the sealing medium, which had in the first place been contaminated by deposits from the plane's engine and subsequently damaged or further contaminated by broken glass, leaves, twigs, water, &c., accumulating in the seal during the period which had elapsed prior to the commencement of the repairs.

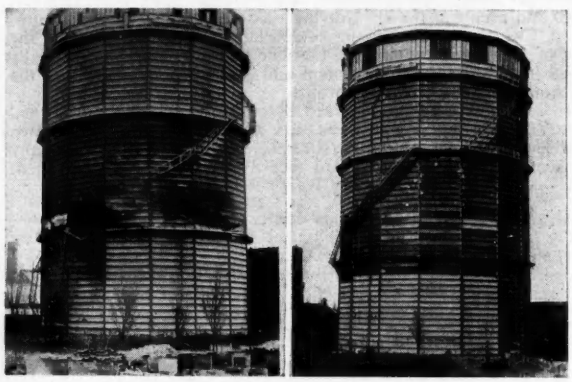
The main damage was to the shell of the holder, and several of the main stanchions were completely severed, permitting the upper part of the shell and roof to sag. The impact of the plane had given the shell a marked twist. At one period during the reconstruction 27 special high tension steel guys with stretching screw and anchors sunk 8 ft. in the ground were in position and retained until the new sections of columns were fixed and riveted in position. By this means the twist was satisfactorily removed and the roof and structure levelled up.

Nothing less than complete dismantling, provision of new column sections, shell plating, balconies, &c., could, in these circumstances, have guaranteed a perfect shell, but it is considered that the results obtained by the methods indicated have proved highly satisfactory.

In view of the very severe strain to which the shell of the holder had been subjected, the initial travel of the piston on its first upward journey following the completion of the repairs was watched with extreme care, and frequent readings were taken of the piston "tilt" and roller "bearings." These readings proved to be even better than had been anticipated, the maximum "tilt" recorded being only ¾ in.

The work of reconstruction was carried out under most trying weather conditions, much of that work being executed during the most severe winter experienced for a number of years, with very strong gales and intensive frosts. This necessitated the greatest possible care being exercised in the removal of the damaged sections of column and the shell plating, and their replacement by the new materials. Photographs were take at regular intervals throughout the progress of the work and these form an intresting record of this unusual undertaking which has been completed to the satisfaction of all concerned.

The photograph below shows the holder before and after repair, the latter having been taken just prior to the commencement of the final painting. This photograph shows clearly the new portions of the shell and columns which have now replaced those portions which suffered such severe damage nearly five years ago. The holder is now in full commission.



The holder before and after repair

Mr. W. H. Bennett, Chairman of the Company, in asking Captain Corbishley to re-inaugurate the holder, recounted some of the incidents experienced at the works during the war and paid tribute to the then Engineer and Manager and his Assistant, who were awarded the M.B.E. and B.E.M. respectively for their gallantry.

Captain **W. J. Corbishley** then performed the re-inauguration ceremony and, from his own experience in civil defence work during the war, paid high tribute to the manner in which the Company had maintained its service to the consumers.

Mr. L. J. L. Walker, Managing Director of R. and J. Dempster, Ltd., explained, for the benefit of the representatives of local authorities and other non-technical visitors, the main characteristics of the waterless holder and the extent to which they differed from those of other types.

After the ceremony the visitors were the guests of the Company at luncheon at the Royal Hotel.

Mr. Bennett, proposing the toast of the guests, regretted that under Government restrictions the number of guests had had to be limited to 100. He welcomed particularly Mr. R. Kelf Cohen, Deputy Secretary and Chief of the Gas Division, Ministry of Fuel and Power, the Mayors of Chichester and Arundel, the Chairmen of the Bognor Regis Urban and Chichester Rural District Councils, and the County Architect. The Company, he said, had always had the most amicable relations with the local authorities with whom they had to deal. In different areas they had to deal with them at different levels. At Bognor Regis they were responsible for the supply of both gas and electricity; at Arundel they supplied electricity only in competition with the Arundel Gas Company (linked with the Brighton, Hove, and Worthing Gas Company); and at Chichester they supplied gas in competition with the Corporation Electricity Department, while they were in partnership with their competitors in purchasing current direct from the grid instead of from the Corporation. He also welcomed many gas engineers who, he assumed, had come as personal friends because there had been little to show them beyond matters with which they were already familiar. He had a special word to

say about Mr. G. le B. Diamond, the South Eastern Regional Controller, to whom they were indebted for great help during the critical years of the war.

Alderman **C. D. Herniman,** Mayor of Chichester, responding for the guests, said that whatever the future might hold in store he was sure the gas and electricity industries would continue to carry out their duties to the consumer to the utmost of their power.

Mr. **A. G. I. Anderson,** Engineer and General Manager, proposed the toast of the contractors, and said that to-day the waterless holder was virtually as good as new. The reconstruction work started in November, 1945, and was completed in June of this year, and during that time they had had the pleasure of many visits from the Chairman and other responsible representatives of Messrs. R. and J. Dempster, Ltd. The Bognor Company, he added, had in hand schemes for extensions to the Bognor works amounting to some £100,000, a substantial part of which had been placed with Messrs. R. and J. Dempster, Ltd. While the Minister of Fuel and Power had exchanged the pick and shovel for the rifle and bayonet, he had to acknowledge that the officials of the Ministry had at all times been most helpful.

Popularity of the Waterless Holder

Mr. **C. Dempster,** Chairman of R. and J. Dempster, Ltd., in reply, said the work of reconstruction had been carried out after consultation with their co-licensees and with the help of a highly efficient staff, and he wished to express publicly his appreciation of the work that had been done, particularly by Mr. G. LeFevre and the foreman who carried out the work under his supervision. Some little time ago the parent Company, the Waterless Gasholder Company, and their co-licensees had been informed by the M.A.N. people that quite a number of such holders had been destroyed. One in the centre of Stuttgart had been set on fire, but it had not exploded; it simply burnt itself out and then collapsed. An order had been placed for th replacement of that holder. The American licensees had reported that they had received orders for quite a number of such holders ranging up to seven million cu.ft. capacity, and were expecting more. In this country they had at the moment one holder of five million cu.ft. going up at Stoke and an order for one of two million cu.ft. at a steel works, and a further order was expected in the near future.

Mr. **G. le B. Diamond,** South Eastern Regional Controller, proposed the toast of the Company. Those who had not lived in coastal towns could never realize what their colleagues had gone through during the war years; personally he would never cease to admire their devotion to duty throughout that period. Every gas undertaking from Selsea to Margate was subjected to attack, except Selsea and Seaford. Of nine recorded attacks on waterless holders in that area, six were on Bognor Regis. The Bognor Regis Company had for years been noted for its enterprise and its wonderful service to the community, and until recently had sold its gas at 11d. per them. If and when the public owner came into possession there was something at Bognor Regis to be proud of, and a tradition of service that the public owner would find it hard to beat.

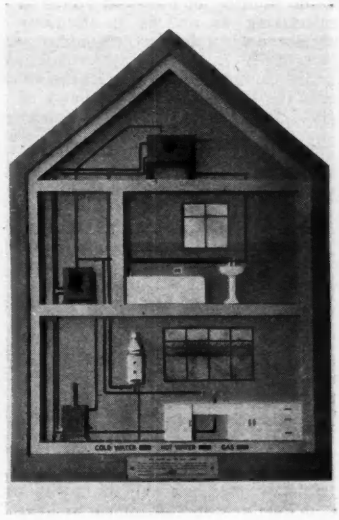
Mr. **H. W. Seymour,** a Director of the Company (described by the Chairman as the only Director who was not an experienced gas man), responded to the toast. He said he regarded gas engineers as a community apart, speaking their own language, but they were an agreeable and delightful lot of men with a very high sense of public service.

HOME PLANNING IN ERITH

A very enterprising exhibition has been arranged in Erith with the theme "The Family and Home." Here examples can be seen of the help given to the family by nursery schools, house and garden designers, house conversion, the makers of kitchen and gardening equipment, the Borough Council, the local Press, town planners; and there is also an effective display of television.

The South Suburban Gas Company has a stand showing the latest types of gas-operated equipment, and the Women's Gas Council a display illustrating its many activities, and an information bureau. Examples are shown of Parkinson's "Renown" gas cooker, a "Lancelot" gas fire in pale apple green, a "782" New World gas copper, an Ascot 212 sink water-heater, a Regulo "302" gas cooker, and F.A. portable gas fires and two-burner hotplates. On this stand arranged by the South Suburban Gas Company is also an effective display of gas by-products, including drugs, plastics, coal tar dyes, and aids to agriculture and transport; and different types of coke are shown.

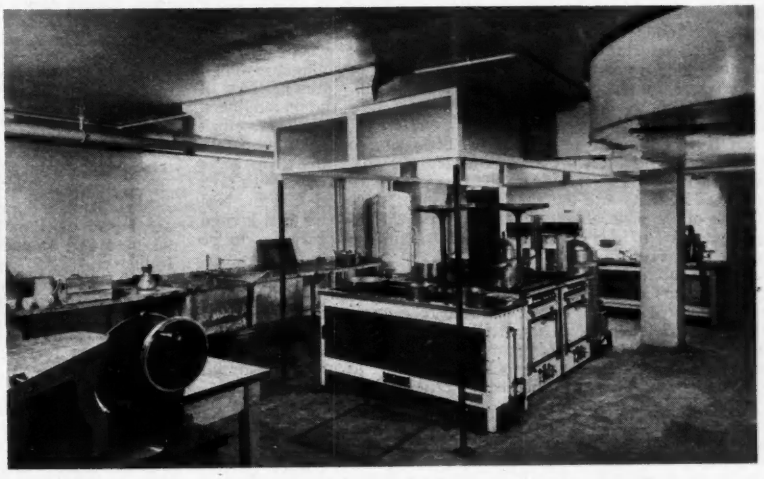
A PLAQUE BY ASCOT



The photograph shows a special plaque designed by Ascot Gas Water Heaters, Ltd., for use in gas showrooms.

It illustrates a cross section of a house and presents a technically correct installation of an Ascot multipoint water heater type NEA.32/6 connected as an alternative to the coke boiler. The plaque measures 4 ft. by 3 ft., and is executed in full colours from a mould, thus ensuring full perspective.

NEW ALBERT HALL KITCHEN



Behind the rushes to the refreshment bars at the Albert Hall is the fine new kitchen shown above from which come the 24,000 sandwiches, 2,000 buns, and 400 savouries sold during a normal 15 minute interval during the Proms season. The bars and kitchens have been been specially silenced so as to obviate noise during performances and the equipment provided includes a four-oven central range (solid top) with hot closet and bain marie, two Rotopan steamers, two 27 in. grills, stockpot stand, pastry oven, 4 in. boiling table, No. 2 Emperor with 65 gall. cylinder for hot water in kitchen, and a gas-fired coffee roaster. The 12 bars each have a Bartlett cafe set, the banquet room has a 7 ft. hot closet with bain maries and a large cafe set, and the service kitchen is equipped with a 27 in. Savoy griller, a No. 3 Standard cooker, and a large cafe set

COMPOSITE GAS AND ELECTRICITY COMPANIES

SO far as we have been able to ascertain, all but one of the composite gas and electricity companies affected by Section 17 of the Electricity Act, 1947—under which such companies have the option of retaining their gas undertakings or asking the Ministry of Fuel and Power to transfer them, with electricity, to the new Electricity Board—have decided to carry on their gas undertakings and to hand over only those portions of their business which are being nationalized under the Act.

Companies whose decisions to this effect have been disclosed are the Ascot District Gas and Electricity Company (one of the South Eastern Gas Corporation companies), and the Bognor and District Gas and Electricity Company, Farnham Gas and Electricity Company, Guildford Gas Light and Coke Company, and York Town (Camberley) and District Gas and Electricity Company (all controlled by Associated Gas and Water Undertakings). In the case of Mid-Southern Utility (Aldershot), the decision of the Board has not yet been communicated to the shareholders.

Brixham Asks to be Taken Over

The proprietors of the Brixham Gas and Electricity Company decided at an extraordinary general meeting at Winchester House, Old Broad Street, on Oct. 10, to ask the Ministry of Fuel and Power to transfer the Company's gas undertaking, as well as its electricity undertaking, to the new Electricity Board when the electricity industry is nationalized under the Electricity Act, 1947. The formal resolution was in the following terms: " That the Company serve on the Ministry of Fuel and Power a notice under the Proviso of Sub-section 1 of Section 17 of the Electricity Act, 1947, to the intent that Sub-section 17 shall not apply."

Mr. **Leslie Walker,** M.B.E., D.L., J.P., Chairman of the Board, who presided, first enlarged on the statement previously circulated to the shareholders, extracts of which were published in the " JOURNAL " last week, and proceeded to give the Board's recommendations as to whether or not the Company's gas undertaking should be retained.

He explained that, as the Company's securities were not quoted on the Stock Exchange, the assessment of compensation was left to negotiation or arbitration. On the basis that the Company's electricity undertaking constituted 45% of the whole, the effect of retaining the gas undertaking would be that a holding of British Electricity Stock would be substituted for 45% of the Company's share and loan capital, but until the value to be attached to the Company's shares had been determined and the terms of issue of the British Electricity Stock had been disclosed it was not possible to estimate with any precision what the effect on the Company's revenue position was likely to be. But bearing in mind other factors, such as the increased incidence of the overhead costs, it would probably be difficult to maintain the present Ordinary dividend.

Similarly if the whole undertaking were transferred, the position of the shareholders would depend on the value attributed to their shares and the terms of issue of the British Electricity Stock—both unknown quantities. The terms on which the Government proposed to take over the Gas Industry were not known, but assuming that they were comparable with those contained in the Electricity Act it was vitally important to maintain the capital value of the undertaking. The Board were doubtful whether this could be done if the gas undertaking was retained.

Although reluctant to part with an undertaking which had been owned by the Company for so many years, and after giving due weight to the decision reached at a recent meeting of representatives of " composite companies," the Board, in the interests of the shareholders, were bound to give very serious consideration to the adverse effect which it was thought would follow a division of the Company's undertaking, and therefore recommended the shareholders to serve notice on the Minister requiring the new electricity authority to take both the electricity and the gas undertakings. In order that the best interests of the shareholders might be served, the Board had invited representatives of the Company's auditors and legal advisers to be present to answer any relevant questions.

A Preference shareholder said he had understood the Chairman to say that if the Company retained its gas undertaking and handed over only the electricity undertaking it would retain assets in the shape of British Electricity Stock to the extent of approximately 45% of the capital of the composite Company. His own impression had been that the individual holder of stock was entitled to have transferred to him his percentage of the British Electricity Stock.

Mr. **M. A. Liddell** (of Messrs. Dyson, Bell & Co., legal advisers to the Company) said that what the questioner had said was quite true when dealing only with an electricity undertaking. Where an electricity undertaking was taken over under the Act the stock was distributed direct to the shareholders, but where they were dealing with a composite company which had another undertaking as well as electricity, and which decided to retain that undertaking, the matter was dealt with under Section 17 of the Act, which provided that the compensation in the form of British Electricity Stock was paid to the Company, and not to the individual shareholder.

Mr. **Arthur Valon** said he felt that if the Company retained its gas undertaking the Board should have power to repay to each shareholder his proportion of the compensation received for the electricity undertaking, but the Act was not so drawn, and no power was given to the Company to do so.

As there were no further questions, the Chairman moved the resolution which, in simple language, meant that the proprietors wished the Electricity Authority to take over both gas and electricity.

Although the Preference shareholders were not entitled to vote, a separate card vote was taken, and in both cases the Chairman declared the resolution to have been carried. It only remained for him, he said, to thank the proprietors for their attendance, and to express his regret that this step had become necessary. He had been associated with the Company for 20 years, and parting with old friends was never a pleasant experience. He felt, however, that they had done the right thing, and the proprietors had confirmed the Directors' recommendation.

One of the Preference shareholders thanked the Chairman for his conduct of the meeting, and the Directors for their courtesy in extending an invitation for the Preference shareholders to attend the meeting.

"HOUSES INTO FLATS" AT BRISTOL

Local authority representatives, housing experts, and builders attended a reception sponsored by the Bristol Gas Company in connexion with the free distribution of the new publication, " Houses into Flats," produced by Ascot Gas Water Heaters, Ltd.

Left to right: Mr. G. H. Palmer (Secretary, Bristol Gas Company), Mr. Noel S. Smith (Distribution Manager), Alderman C. R. Gill (Chairman, Bristol Housing Committee), Mr. Nelson J. Meredith (Bristol City Architect), Lord Limerick (Chairman, Ascot Gas Water Heaters, Ltd.), and Mr. James Carr (General Manager, Bristol Gas Company)

The guests were addressed on various important matters appertaining to the national housing problem and the new publication was distributed during the tea interval.

COPPER AND BRASS TUBES FOR GAS INSTALLATION WORK

New British Standards for solid drawn copper and brass tubes are based on B.S. 659, B.S. 885 and B.S. 886, which have been adapted and amended to suit the special requirements of the Gas Industry.

B.S. 1401 is for copper tubes, plain or screwed, as may be required, for installation work and also for gas lighting fittings.

B.S. 1402 is for annealed brass tubes for installation work normally screwed.

B.S. 1403 is for brass tubes for gas lighting fittings normally screwed; these tubes are intended for the manufacture of pendants, brackets, and other lighting fittings and are somewhat stiffer than for installation work.

Tubing of the kind for installation work has to withstand bending and manipulation at site; for special purposes where maximum flexibility is required as, for example, in bent connexions to meters, fully annealed copper tubing is advised in the foreword. Each standard includes tolerances as to size, and prescribes tests. In the case of B.S. 1403 a mercurous nitrate test is specified.

Copies of this Standard (Nos. 1401-1403) may be obtained from the Sales Department, British Standards Institution, 24, Victoria Street, London, S.W.1, price 2s., post free.

EASTERN DISTRICT TAR BOARD

THE Annual Meeting of the Eastern District Tar Board was held in Norwich on Sept. 24 under the chairmanship of Mr. J. Hunter Rioch, Managing Director of the Cambridge University and Town Gas Light Company and Chairman of the Eastern District Tar Board.

Mr. J. Davidson Pratt, Chairman of the British Road Tar Association, after congratulating the Executive Committee on setting a fine example in the arrangements made for the meeting, which was the first of the 1947 annual Tar Board meetings, gave a resume of the work of the British Road Tar Association during 1947, which had been a particularly active year for the Association.

He dealt with research, propaganda, and the work of the Technical Committee, concluding with a brief reference to the factors which had necessitated increasing the basic subscription to the Association by 45% and to the work of the Committee which was set up to clarify the Constitution and Rules. A code of Sales Practice would shortly be circulated to members of the Association which he felt sure would assist the producers in giving the maximum service to the users of road tar.

After a short discussion, during which Mr. **W. E. Cone,** Technical Adviser, referred to the programme for the future, Mr. Hunter Rioch thanked Mr. Davidson Pratt for his lucid summary of the year's activities.

provision within the framework of the British Road Tar Association, for regular official contact with the two great road users' organizations, the Automobile Association and the Royal Automobile Club, but he felt sure they would have quite a considerable contribution to make from the road users' point of view.

He specially welcomed the guests because he believed such functions provided the opportunity of pooling experiences between the surveyors and the road tar producers and of discussing difficulties encountered. The producers, he knew, would be glad of any information which would lead to improving the quality and usefulness of their product.

Mr. H. C. Rowley, City Engineer of Norwich, responding to the toast, said that he felt the Chairman had made a good point about making contact with the Automobile Association and the Royal Automobile Club. Technical men tended to look for technical criticism but he felt sure that these Associations could be very useful in giving the views of their members arising from their experiences as ordinary road users. For himself, although he did not criticize the material he felt that there was room for a very great improvement in the methods of applying it in the maintenance of highways.

Technical Aspects

Mr. **Davidson Pratt,** opening a discussion on technical aspect- of the use of road tar, said that in view of the present economic cond i

Members of the Eastern District Tar Board, County and Borough Surveyors, and prominent personalities, among whom are Mr. J. Hunter Rioch, Chairman of the Board, Mr. R. A. Weston, Vice-Chairman, Mr. J. Davidson Pratt, Chairman of the B.R.T.A., and Mr. H. C. Rowley, City Engineer of Norwich

Members of the Board and the surveyors who were their guests at the luncheon which followed the meeting were keenly interested in the mobile laboratory of the Midland Tar Distillers which was available for inspection during the morning.

A large and representative gathering of County and Borough Surveyors joined members for lunch.

Mr. **Hunter Rioch,** in proposing the toast of "The Guests," said that in continuance of the Board's policy of holding the annual meeting in different towns in successive years, Norwich had been selected this year.

The choice had been justified because surveyors from that part of East Anglia were well represented. Whatever other experiences surveyors had had since last year's meeting, he was sure that all had experienced two things, namely, damage to their roads by the exceptionally severe weather last winter, and the widespread cut in the grants made for road maintenance this year. Both these factors meant that heavier demands would be made on the quality of tar supplied by the road tar producers, because length of life of the wearing surface became of increasing importance. Neither the British Road Tar Association nor the Eastern District Tar Board was a selling organization but they did set out to make tar a more efficient servant of the public and he referred to the importance of the Standard Certification Scheme introduced two years ago.

Road Users' Point of View

Several parties were interested in tar before it reached the road surface, namely, the producer, the contractor who applied the tar —where this was not done by the surveyor's own staff—the surveyor himself, the Divisional Road Engineer, and after the tar had been applied, the road users were interested in it because of the type of surface it gave, the ease of riding which it provided, and the safety it ensured for modern traffic. He was not aware that there was any

tions there might well be even more cuts in expenditure on roads next year and the question arose as to how the money available could best be spent. Most of the money would be absorbed in maintenance and there would be little or none for new construction. Surface dressing well done was the most economical form of maintenance and if it did not last three years or more it was indeed a poor result. This present stringency meant that they must not only produce first class tar but must find the best ways of using it.

Mentioning the Tar-way Code for Foremen which had been widely circulated to surveyors for their staffs, he said that the tarspraying indicator which had been held up by the shortage of supplies would soon be available. Research had been continued in collaboration with the Department of Scientific and Industrial Research and the Road Research Laboratory in carrying out experimental road work to try out results. A laboratory durability test for tar had also been devised in which the tar was submitted to oxygen under pressure and good results were expected from this test. They had recently provided their travelling representatives with a set of slides to enable them to bring the best modern practice to the notice of those whose job it was to apply the tar and a new sound film was being prepared. The Association was also publishing a Code of Practice for Surface Dressing embodying both mechanical and hand methods of application. However scientific their tar specifications might be, surface dressing was still not a science.

They had recently carried out experimental work on wetting agents but it seemed that what was really necessary was an improvement in meteorological forecasts, since the most important factor undoubtedly was the dryness of the weather in the 24 hours immediately after spraying the tar.

Not enough was known about the economics of road maintenance, and he appealed to the surveyors present to assist in compiling records for the benefit of all, by sending them particulars of the materials

used, the conditions of application, and the service obtained from roads for which they were responsible.

A lengthy discussion followed in which among others Mr. H. C. Rowley (Norwich), Mr. W. C. Gibbs (West Suffolk) and Mr. J. B. Storey (Ipswich) took part. Reference was made to the shorter life of surface dressing on city roads with concentrated traffic, to experience with wetting agents, and the effect of different subsoils on road maintenance, but there was general agreement that surface dressing was the most economical method under normal conditions.

After lunch members and their guests embarked for an enjoyable two hours' cruise on the Norfolk Broads followed by tea at Wroxham and returned to Norwich by motor coach.

NORTH OF ENGLAND ASSOCIATION

THE Autumn Meeting of the North of England Gas Managers' Association was held at the County and Station Hotel, Carlisle on Oct. 3. The **President** of the Association (Mr. J. G. Aitken, Carlisle) was in the chair, and among those present were Dr. Harold Hartley (President of the Institution of Gas Engineers), Mr. E. Crowther (Senior Vice-President, Institution of Gas Engineers), and Mr. T. R. Cook (President, Manchester District Association of Gas Engineers).

The proceedings commenced with a civic welcome to the members by the Mayor of Carlisle (Councillor Harold Greenop, J.P.), in the course of which his Worship referred to the fact that on two previous occasions, in 1878 and in 1922, Carlisle had had the honour of providing a President for the Association. The Corporation of Carlisle were proud that their present Engineer and Manager, Mr. J. G. Aitken, had been so honoured and felt that this was but a fitting recognition of his high qualities and abilities.

The following new members were elected: Members: S. A. Tait (Stanley), and R. S. Longhurst (Carlisle) ; Associates: A. F. J. Abley (Shotley Bridge), and George Ewart (London).

The President then delivered his Address. This was published in the "JOURNAL" last week.

A vote of thanks to the President was proposed by Mr. B. Richardson (Newcastle) and seconded by Mr. J. H. Race (Scarborough).

Following the general meeting members were the guests of the President at luncheon.

Address by Dr. Harold Hartley

Following luncheon an Address was delivered by Dr. **H. Hartley** who said: This year you attain the 70th anniversary of the founding of the North of England Gas Managers' Association, and the Carlisle Undertaking, for which your President is responsible, has been supplying town gas for well over a century and a quarter. Both are part of the whole of our British Gas Industry which has been operating for almost a century and a half.

Some 22 million tons of coal are now used annually for the making of town gas and coke. The demand for these latter fuels has grown steadily during the last century and has increased especially in the last 40 years. There is every indication that in the future the Gas Industry will play an even bigger part in the affairs of the nation than it has done in the past. The record of its service to industry generally and thus to the nation in the two world wars is well known and needs no stressing to a gathering of this type.

We are only concerned with the past in so far as the experience may be helpful—our thoughts are on the future of the Gas Industry. Much may be expected from integration and rationalization provided this is effected in an objective manner and with an appreciation of the service to be rendered to the country. Of recent years the industrial load has grown, and for the Gas Industry as a whole this will assume still greater importance in the future. The domestic load, however, still predominates and, despite the competition of alternative sources of energy, we have every reason to believe that if the opportunity is tackled properly the demand for town gas and coke for the homes may so grow as to render the increases in output of past years relatively insignificant. It is important we take steps to inform ourselves what are likely to be the demands for our products. To some extent in the past, development has been haphazard, but if we so desire I am sure it should be possible to plan progress in the future.

In his Presidential Address, Mr. Aitken has indicated the part which the technician can play in ensuring that integration, when effected, shall be done in a successful manner. In addition, however, we must look to the technician for guidance as to the direction in which progress in the future should take place. We must not stress unduly all the uses to which gas can be put, but must determine the purposes for which gas and coke should be used in the national interest. The demand for heat services in the home will grow very rapidly. People in this country are not likely to remain content with ill-heated houses and inadequate hot water supplies, as has been the case in the past. The standard of comfort provided in the post-war houses is so much above that which was available to many of the community before the war that it is unlikely the mass of the people will continue to be satisfied with the conditions of life they have had to endure in the past. Much can be done in our homes with the smokeless fuels without involving prohibitive costs, but this may involve big changes in our own outlook and practice—the coal industry, the electrical industry, and the oil industry are all interested. We must make sure that the technicians, the economists, and above all the leaders of our Industry appreciate their responsibility and undertake the work which lies to their hand.

Much has been achieved by individual action but more effective work can be done by co-operative effort, and I suggest this is a matter in which you should interest yourselves. Do you give thought to the type of development in manufacture and utilization needed in the next 20 years ? The planning must be done by those of the higher executives of the Industry most fitted for the responsibility. To do the planning well, facts must first be collated and it is in this connexion that the individual engineer has a responsibility, especially as so many of you combine the functions of chief engineer and manager. Out of knowledge grows strength and sometimes wisdom. See that you are fully informed of the main technical developments not only in our own Industry but in the other industries located in your areas—increase your political consciousness by appreciation of the views and desires of your fellow-citizens and study the impact of the resulting trends on your own work.

Our Industry should have a great future, but we must act in order to deserve it and not be content to sit still and live on the hope that the plums will fall into our lap. Action is needed now; seize your opportunity and shape your own future. The men of the Northern Counties lay claim to be individualists; at their best when the going is rough. See to it that you make yourselves felt—that your experience and needs are appreciated.

I am here in my capacity as President of the Institution of Gas Engineers, the senior professional body of the Industry responsible for maintaining and extending the professional qualifications of the Chartered Gas Engineer—men whose basic training may have been that of an engineer, a chemist, or a physicist—sciences which are all applied in our daily work. But in addition the Institution has the responsibility of guiding the profession and indicating the lines along which development should flow. You nominate a representative to the Council, then see to it he is in a position to expound your views and convey your support. On behalf of the Institution I convey hearty congratulations on the continued activities of your organization and sincere good wishes for the future.

The **President** voiced the thanks of the members to Dr. Hartley, and said how gratified they were that he had been able to make the long journey in order to be present at the meeting.

Mr. **E. Crowther** proposed a vote of thanks to the President, the Mayor of Carlisle, and the Corporation of Carlisle for their hospitality.

The **Mayor,** in replying, said they were always happy at Carlisle to receive Associations similar to this one and it was extremely gratifying to hear the kind sentiments voiced by Mr. Crowther.

Visit to Biscuit Works

In the afternoon a visit was paid to the Biscuit Works of Messrs R. Carr and Co., Ltd., where the members were welcomed by Lieut.-Col. R. N. Carr. It was pointed out that in these works the daily gas consumption was 1¼ million cu.ft. and in the absence of restrictions this quantity could be exceeded. Lieut.-Col. Carr paid tribute to the efficacy of gas as a fuel in the biscuit manufacturing industry. The members then proceeded to tour the works in small parties, at the close of which the President expressed thanks to Lieut.-Col. Carr for his kindness in providing facilities for what had been an extremely interesting and enjoyable visit. The members then returned to the County and Station Hotel and were entertained at tea by the Mayor.

NORTH OF ENGLAND AUXILIARY

Under the chairmanship of Mr. Bernard Richardson, the Autumn Meeting of the North of England Gas Managers' Association (Auxiliary Section) was held on Sept. 26, and was the occasion of a visit to the Monkton coke and gas-works, Pelaw, Co. Durham.

The members travelled from Newcastle station by bus, and on arriving at the Monkton works were welcomed by the Manager, Mr. W. Jeffrey. Forming into small parties, the visitors were conducted round the works by Mr. Jeffrey and his staff. After the inspection the members were entertained at tea.

The Chairman expressed the thanks and appreciation of the Section for a very interesting visit and the hospitality extended, which were acknowledged by Mr. Jeffrey.

THE HISTORY AND RECENT DEVELOPMENT OF THE WET GAS METER*

By B. R. PARKINSON, M.I.Mech. E., Hon.M.Inst.Gas E.

(*Continued from p. 107*)

PART 2—RECENT DEVELOPMENTS

Accuracy of Test Meters

If for the reasons above stated the wet meter is practically extinct to-day as a consumer's meter, it is some satisfaction to consider that it remains a necessity for the laboratory, and may even compete with the test holder for proving dry meters. For the accurate measurement of gases in the laboratory it is usual to assume that we must employ a liquid, and as the accuracy of the wet meter drum is entirely dependent upon its liquid level, all attention should be given to the influence which its construction and movement has upon the water line that forms the vital measuring boundary. The resistance of the drum in rotation as its partitions are forced by the pressure of gas through the water is considerable; in fact the pressure required to drive it varies as the square of the speed. The driving pressure depresses the water in the measuring chambers, and it therefore follows that at every change of speed there is variation in registration. This important source of error in test meters has not had the attention in the past which it requires. Meters have been tested and the water level set at a certain rated capacity, or speed, and subsequently employed at other speeds at which they were incorrect but assumed to be correct.

Geometry of the Crosley Drum

To introduce the improvements that have been made for the reduction of such errors, the geometry of the drum must first be explained. Figs. 6A and 6B show drums with three partitions and four partitions respectively, from which it will appear that the minimum of three partitions is scarcely enough to ensure smooth running without oscillation, as one inlet appears above the water line only just in time before the preceding one submerges, and the same with the outlets at the back. (The water line is shown on each of these figures in dotted line above the centres opening.) The partitions appear in Figs. 6A and 6B, on front views of the drum, as radii, as though they were taken straight across; in which case they would meet with the maximum resistance in passing through the water as the drum revolves. Actually they are inclined, as in Fig. 7, and this inclination has always in the past been made exactly to the diameter of the centre opening circle. Then the seal hoods are added, back and front, as in Fig. 8, and these are brought down to the *seal line* which is tangential to the centre opening, thus forming the inlet and outlet ports of the drum. This construction involves a lap of the seal hoods over one another and space has to be allowed within the lap sufficient for the passage of gas. The complete drum is shown in Fig. 9.

Pressure Absorption and the Centre Opening

If the centre opening circle be smaller, as in Fig. 10, the lap of hoods is greater, but on the other hand, if the centre opening be sufficiently large, as in Fig. 11, the lap can be entirely eliminated. This, of course, would not be possible with a three partition drum. The construction is much simplified and improved by eliminating the lap, and although the capactiy per revolution is diminished by a large centre opening, the speed of the drum for a given pressure absorption is so greatly increased that the overall capacity is much higher. In fact the speed of the drum (within limits) increases approximately in direct proportion to the diameter of the centre opening. Thus the speed of the drum in Fig. 11 is 2½ times as great as that of the drum in Fig. 10. This is a discovery of recent years, and it is the clue to the greatest speed of the Crosley drum. It is also equivalent to a reduction in *pressure absorption* for a given speed in the proportion 6 to 1. But it is not the best method, for a large centre opening means a high water line and a high water line carries a greater percentage of error for a given fall or rise in the liquid level.

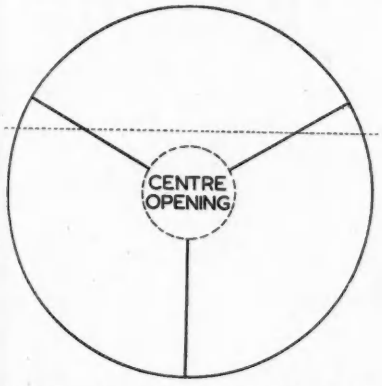


FIG. 6A.—*Drum with three straight partitions*

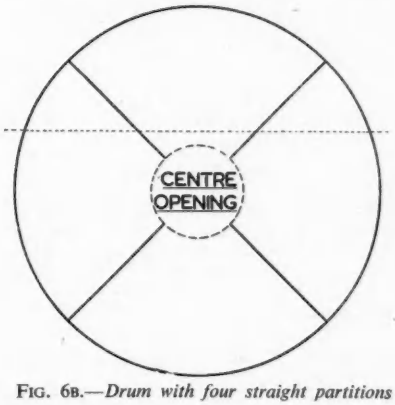


FIG. 6B.—*Drum with four straight partitions*

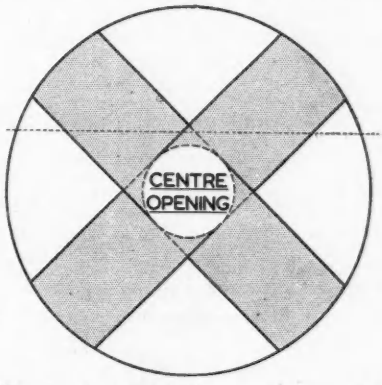


FIG. 7.—*Partitions inclined to centre opening*

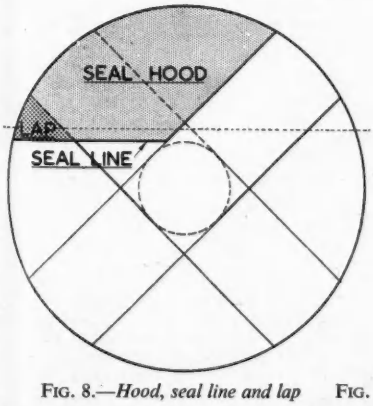


FIG. 8.—*Hood, seal line and lap*

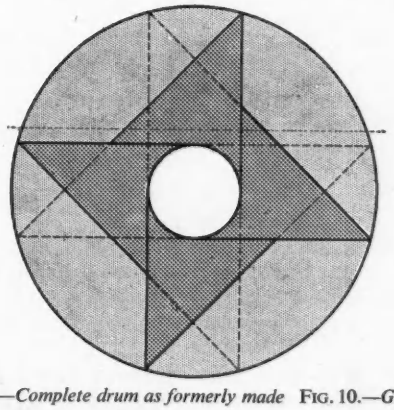


FIG. 9.—*Complete drum as formerly made*

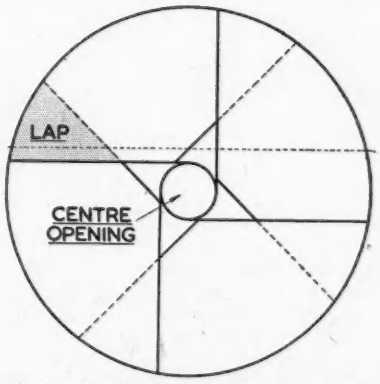


FIG. 10.—*Greater lap of seal hoods with smaller centre opening*

* From a Paper read before the Institute of Statutory Inspectors of Gas Meters at Brighton on Sept. 24, 1947

Pressure Absorption and the Inclination of Partitions

There is another way of increasing speed which also for 100 years never seems to have occurred to those who have designed and made wet meters. As previously mentioned, the inclination of the partitions was always set to the diameter of the centre opening circle, so much and no more (see Fig. 7 again). No one seems to have got hold of it who was sufficiently interested in geometry to perceive that there is really no fundamental relation between these two. The inclination of the partitions can be increased *ad lib.* while the centre opening remains small, although the graphical projection may not be quite so simple. Fig. 12 shows the centre opening 25% of the diameter and the inclination of partitions 51%, and this construction also gives us no lap of the seal hoods. That is the specification now adopted. It gives a sufficient centre opening for the spout, and no inlet and outlet passages. The end hoods, as shown in Fig. 13, come out smaller and are flush with the end of the drum perimeter, making it easier to calculate the capacity. The whole drum is very open and acessible. Compare Fig. 13 with Fig. 9, the pressure absorption being reduced approximately in the proportion 4 to 1. It is undesirable that any measuring instrument should function at the expense of considerable pressure loss, most of all one comprising a liquid seal.

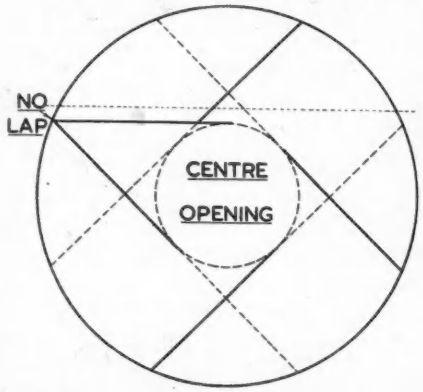


FIG. 11.—*Large centre opening and no lap*

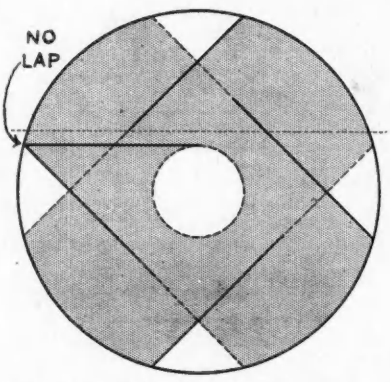


FIG. 12.—*Large inclination of partitions and no lap*

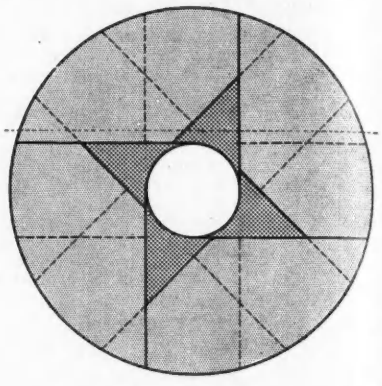


FIG. 13.—*Complete drum as now made*

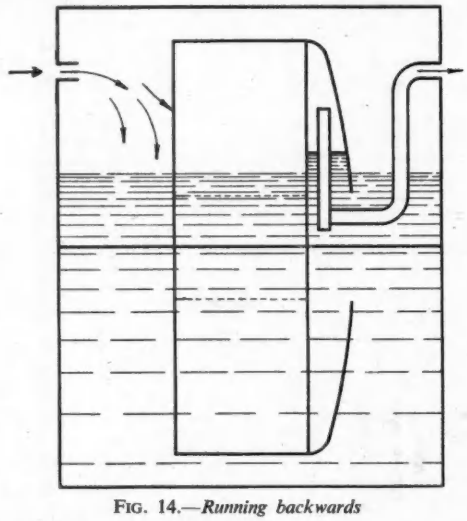


FIG. 14.—*Running backwards*

Further Reduction of Error

Having thus reduced the actual pressure absorption of the drum, there is a further expedient by means of which the effect of the pressure absorption on the measurement can be greatly modified. That is to run the drum *backwards*. This device is not new; it was introduced in large station meters many years ago by the late Mr. Charles Hunt, at the Windsor Street works of the Birmingham Gas Department, where the Author was a pupil. This is illustrated diagrammatically in Fig. 14, where it will be seen that inlet pressure bears on all the water in the case except that in the spout chamber. The theory of the U-tube pressure gauge is that for a given pressure, the fall of liquid level on the one side is to the rise of level on the other inversely as their respective areas. Here in Fig. 14, the area of water in the case is common with that in the measuring chamber of the drum; it is all under inlet pressure and only the spout chamber is under outlet pressure while measuring takes place. Thus for a given pressure absorption the depression of liquid level in the case and in the measuring chamber of the drum can be very small compared with the rise of level in the spout chamber. So far as running the meter backwards is concerned, it does not matter in the least to the drum which way it goes. There is only one reason to suggest why this running backwards was not generally adopted by makers. The pressure absorption of the old type of drum was so considerable that water might pile up in the spout chamber and splash over the spout, so the makers evidently preferred to play for safety and keep inlet pressure rather than outlet pressure in the spout chamber. There was not much that the old makers did not know about the snags and inconveniences of the water in their wet meters, and so we can leave it at that; but now the drum is designed to take much less pressure absorption and we are only concerned with laboratory meters, such an objection no longer holds. It is encouraging to note that in recent years the small wet test meters of Professor Boys and Major Hyde have been run backwards—*vide* the book on "Gas Calorimetry," by Hyde and Mills.

With the meter running backwards and the water level in the measuring chambers of the drum plus the case only very slightly depressed, it follows that the larger the area of the case the more accurate is the measurement. The increased area can be provided, not by actually enlarging the case, but by adding what may be called "wings," but these are only necessary in the smaller sizes (Fig. 15).

A New Meter

Figs. 15 and 18 illustrate a test meter of the most recent design embodying the above mentioned improvements and others to follow.

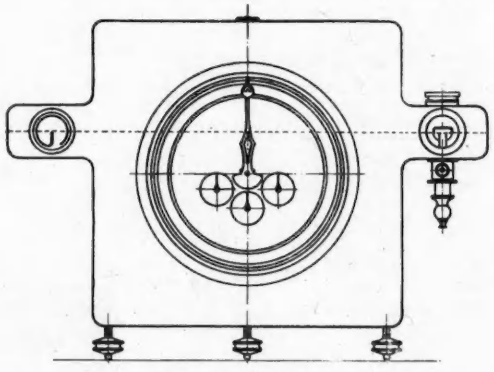


FIG. 15=*Winged case*

Limit of Error

To calculate the required area of the case, a limit of error 0.2% is set between the performance of the drum at its slowest speed and the performance of 400 revs. per hour; that is, over the whole range of speed from zero to 400 revs. The old type of drum would not run to that speed without blowing its seal, or the error might be over 10%.

With the error 0.2%, extended over so great a range of speed as 0 to 400 revs. per hour, it follows that at normal variations in speed within that range, say 50, 100, 150 revs. per hour, the error is practically negligible.

Setting the Liquid Level

The meter is watered when at rest, and in order to make this operation exact an old device originally patented by Mr. William

Cowan and known as the "*syphon overflow*" has been adopted (see Fig. 16). This consists of an overflow tube surmounted by a cap so as to form a short but definite syphon. When the meter has been levelled, water is poured in until this short syphon comes into action. It overflows until the required level is attained, and then cuts itself off quite suddenly, leaving scarcely a drip, so that the attained level can be accepted as unequivocal. This method of water lining, which might be described as automatic, cuts out all uncertainty due to the eye or ambiguity due to meniscus. The Cowan syphon overflow appears to provide two menisci, one up and one down, which compensate one another. The overflow is adjustable and it is presumed

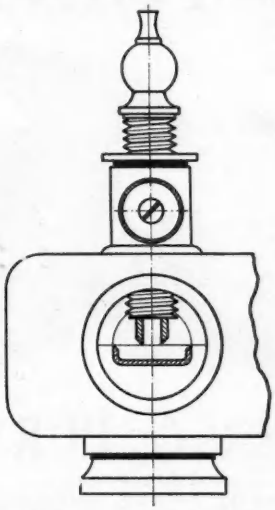


FIG. 16.—*Syphon overflow*

that it has been set and fixed when the meter was last proved against a test holder or cubic foot bottle. Afterwards water must never be added in less quantity than sufficient to flood and operate the syphon, for it is the syphon that determines the water level.

When the meter is first watered and the water is entirely fresh, it is as well to pass some gas through before finally operating the syphon overflow in order to saturate the water with such constituents as the gas may be inclined to give up to it.

With the Meter at Rest and Fully Vented

The operation of water lining *while the meter is at rest* requires that the connexions shall be open to atmosphere so as to give complete vent. It is desirable to re-water line periodically on account of possible

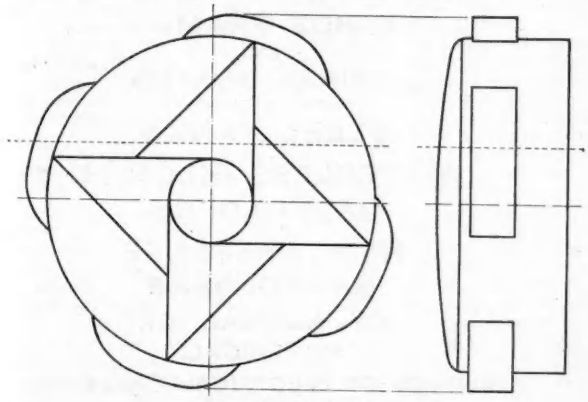


FIG. 17.—*Hump drum*

evaporation or making up by constituents from gas that has passed through the meter.

The Hump Drum

The Crosley drum is only accurate in units of one revolution. The custom has been to subdivide it equally and mark these as decimals on the scale; thus fractional readings have been always inaccurate. With a four-partition drum the four quarters are nominally equal (bearing in mind that it is a handmade product), but subdivisions of the quarters are very unequal. An attempt to correct this has been made by the introduction of the "hump" drum (Fig. 17). This has four extensions on the rim designed to make up the deficiencies in displacement where these occur. The humps were evolved by trial and error and considerable calculation; they are only designed to give equality in segments of one twentieth of a revolution. It was essential that they should be streamlined so as not to hinder the smooth passage of the drum through the water.

This construction has been provisionally patented, but it has not yet been decided whether the additional expense justifies its advantage. So long as a drum is hand made it must be impossible to guarantee complete accuracy in fractions of a revolution.

Accessibility

In this new test meter (Fig. 18) the housing of the drum in the case is so arranged that the whole of the interior mechanism can be detached from the case in one unit, complete with inlet and outlet pipes. It could even be placed in an open tank and worked as a meter. This arrangement is useful for occasional inspection, and, if necessary, repair. There is a demand for small wet test meters for chemical gases where periodic cleaning is desirable.

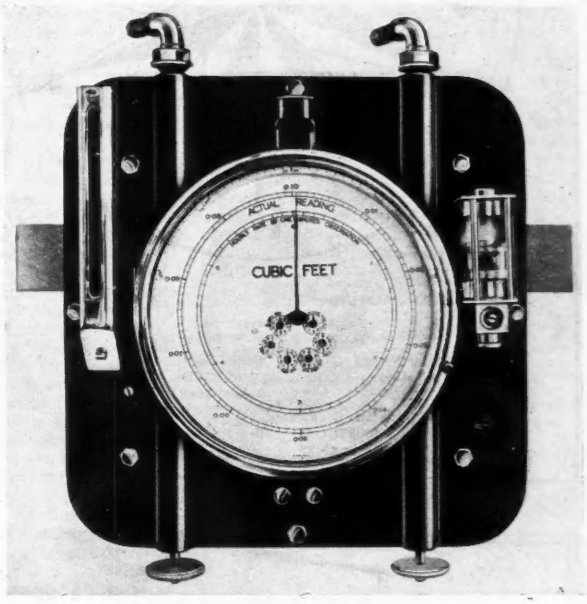


FIG. 18.—*Complete Test Meter*

Conclusion

This general overhaul and re-design of the wet test meter has been undertaken in recognition of the fact that measurement is the basis of all scientific method, and accuracy in measurement the essential to scientific achievement. It follows therefore that at the present day, with the closer application of science to the manufacture of coal gas, the measuring apparatus should take its place, not as a recorder of that which is merely approximate and interesting, but as an instrument of precision whose accuracy is of vital importance.

CUMBERLAND AND WESTMORLAND ASSOCIATION

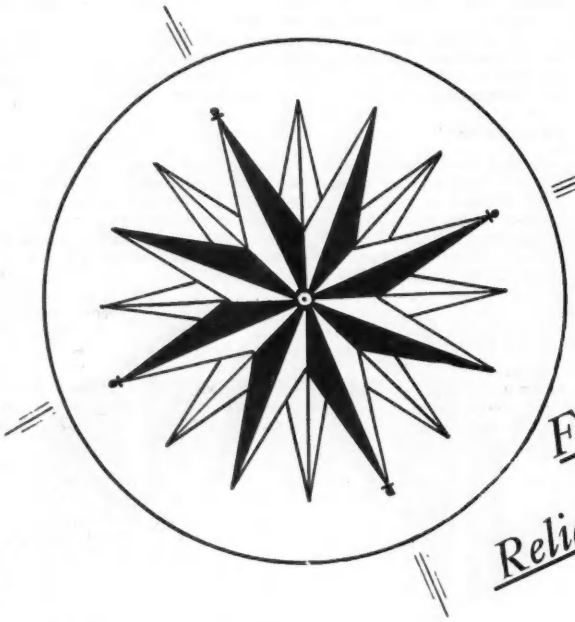
The Autumn Meeting of the Cumberland and Westmorland Gas Managers' Association was held at Maryport on Oct. 2 under the Presidency of Mr. T. H. Large, Engineer and Manager, Maryport Urban District Council Gas-works.

The President welcomed as a new member Mr. R. Norgate, who was recently appointed Engineer and Manager of the Cockermouth Urban District Council Gas-Works, and after formal business a visit was paid to the works of Messrs. Hornflowa, Ltd., Solway Estate, Maryport. These works produce millions of buttons for the clothing trade from animal hooves ground to extremely fine limits, which are then moulded under heat and pressure with a plastic binder. Smaller amounts of extruded plastic articles are also produced and this part of the business is at present being developed with a view to expansion.

Under the guidance of Mr. J. B. Fortune, Works Manager, and Dr. Niger, Chief Chemist, the party was conducted over the works so as to follow the processes involved from the raw materials to the finished articles.

The President, in thanking the firm, said they were greatly indebted to them for their kindness and courtesy and that he and his fellow-members had been impressed by the cleanliness and efficiency of the works and the obvious signs of a deep interest in the welfare of the employees.

CARDINAL POINTS



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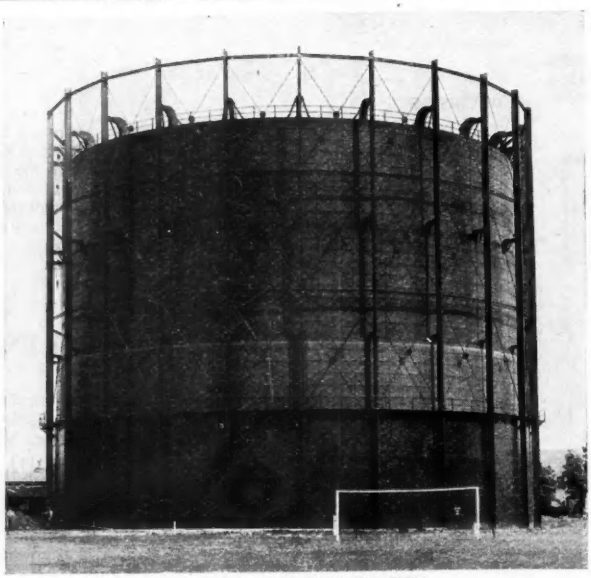

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GAS UNDERTAKINGS' RESULTS

South Australian Gas Company.—Trading profit for the year ended June 30 was £70,003, making, with the balance brought forward, an available total of £128,594. Of this sum £32,364 has been transferred to special purposes fund and £2,525 to depreciation fund for works on leasehold land. A dividend of 4% leaves a balance of £37,705 to be carried forward. The Directors report that frequent interruptions in supplies of coal necessitated on 85 days the imposition of gas restrictions. In addition a strike at the Company's works lasted for 53 days. These occurrences caused heavy losses of revenue.

St. Helens Gas Department.—In the year ended Mar. 31 there was an increase in the sales of gas over those of the previous year equivalent to 19%. The gas made was 1,933 million cu.ft. (It is interesting to note that in 1937 the gas made was 1,126 million cu.ft.) Gas sold for industrial purposes and bulk loads to other undertakings represented 44.7% of the total sold. The gross profit amounted to £80,212; the net profit was £29,904. Revenue contribution to capital amounted to £23,646, and the contribution in aid of the rates amounted to £12,000. The reserve fund was maintained at its maximum figure of £50,000, and a surplus of £6,330 was carried forward as against a surplus for the previous year of £12,072. The price of gas was reduced by the payment of a special additional discount of 2½% on all gas charges from Oct. 1. This was in addition to the special discount of 5% for prompt payment of accounts. The plant is in a first class state of repair and in October important plant extensions were inaugurated, namely, a new welded gasholder of three million cu.ft. capacity, the largest welded holder yet put to work in this country, and two new benches of Glover-West continuous vertical retorts, which were erected in 1942 and 1943 respectively. The top of the bench in these installations introduces a re-designed system in accordance with modern standards of improved condition of operation.

Darwen Gas Department.—In spite of increased costs another successful year has produced a gross profit of £10,809, which after deducting income tax amounting to £7,259 and interest on loans, &c., results in a net profit of £1,460. The Department contributed £5,000 to the relief of the rates. The total quantity of gas made during the year was 363,616,000 cu.ft. compared with 336,382,000 cu.ft. the previous year. The quantity of gas sold for domestic purposes was 256 million cu.ft. compared with 221 million cu.ft. the previous year and 123 million cu.ft. in 1939. Although 1,136 gas cookers have been supplied and fixed during the last three years, there is still a large number of houses without suitable cooking facilities. The quantity of gas sold to industry was 76 million cu.ft. compared with 84 million cu.ft. last year and 50 million cu.ft. in 1939. The slight decrease this year is accounted for by the shutting down of industry during the fuel crisis. The total increase in gas sales for the year was 7.6%. Record sales of appliances during the year were almost double those of the previous year and the total value amounted to £22,963. An analysis shows that 561 cookers, 444 wash boilers and washing machines and 206 fires and radiators were sold and fixed in addition to 617 sundry other appliances, domestic and industrial. Sales of by-products maintained a satisfactory standard and the total net income from all saleable by-products amounted to £37,822 or 69.14% of the cost of coal carbonized.

The average cost of coal was £2 8s. 3.84d. per ton compared with 25s. 2.85d. per ton in 1938-39, an increase of 23s. 1d., or 91%. Approximately 1,400 tons of coal was saved during the year by the manufacture of carburetted water gas. Recommendations have been prepared and submitted to the Ministry of Fuel and Power for the reconstruction of the gas-works at an estimated cost of £62,500. The Ministry has approved the scheme to replace the old and obsolete plant with new and larger plant together with extensions to existing plant and the detailed work of preparing the necessary drawings and specifications has begun.

Rotherham Gas Department.—At the end of his first complete year's service with the undertaking, Mr. E. B. Field, Engineer and Manager, reports that for the 12 months ended Mar. 31 the output of gas was 2,498,751,000 cu.ft., an increase of 126,158,000 cu.ft. over the previous year. Gas sales showed an increase of 8.7%, and the number of consumers increased from 29,774 to 30,437. Coke oven gas supplies were received at maximum permissable levels, except for a short period in February, when the movement of coal in the district was brought to a standstill by exceptionally bad weather conditions. Income increased by £44,897 and expenditure by £41,977, and there was a net profit of £36,469. Capital expenditure out of revenue account amounted to £21,772, mainly accounted for by the installation of a new dehydration plant and new mains and service pipes. Arrangements are in hand to increase the gas-making capacity to three million cu.ft. per day by the addition of a producer plant purchased from the Ministry of Supply and by carrying out alterations to the works mains and ancillary plant that should enable the carburetted water gas plants to be worked to capacity for a further period. A preliminary plan for closing down the Frederick Street works and extending the Car House works to meet present and future demands has been approved in principle, and the work has been scheduled for completion in the summer of 1949. The scheme includes the installation of gasholders, carburetted water gas plants, steam raising plant, purifiers, boosters, and new trunk mains to serve the districts of Masborough and Rotherham independently, together with a high pressure system for supplying the outlying districts.

Colonial Gas Association.—Net profit for the year ended June 30, after providing for taxation, was £83,349, an average return of 5.5% on the share capital and premiums paid to the Association by shareholders. Dividends at 8% (Australian currency) on the Preference shares, and 5% on the Ordinary shares leave £6,839 to be carried forward to the next account. The quantity of gas sold increased by 2.1%, while the quantity sold by the subsidiary gas undertakings increased by 8.1%. The supply of gas to consumers in areas of Melbourne served by the Company was restricted for nearly 100 days, the causes being irregular and insufficient supplies of inferior coal, and a strike of gas workers which lasted from Dec. 11 to Jan. 16. But for these restrictions the increase in sales would have been appreciably greater. Wages increased substantially. An interim award of the Arbitration Court gave a rise of 7s. per week in the basic wage. The Court also granted 6s. per week to gas employees in lieu of 3s. previously paid. There were also concessions for shift work. All of these factors combined to increase seriously the wages cost. A trunk main connecting the Box Hill works with the Oakleigh works was completed in March and considerable quantities of gas have already been sent to meet the requirements of the Oakleigh district. The new vertical retort house at Footscray was also put into commission during the year.

GAS STOCKS AND SHARES

Repeated warnings by Sir Stafford Cripps that in the absence of some new arrangements for making dollars available to Europe this country would be obliged to make further cuts in its dollar exports, followed on Thursday by the Chancellor's announcement that it would be his duty at a comparatively early stage in the new session to make financial proposals to the House of Commons designed to strengthen still further our budgetary position, had a generally depressing effect on the stock markets last week.

Poor savings figures resulted in a fall in British funds, and notwithstanding the good steel output figures for September most of the heavy industry shares were marked down. The actual number of dealings was slightly higher than in the previous week, but the level of industrial Ordinary shares was 1.8 lower on the week.

The Cabinet changes and especially the appointment of Mr. Hugh Gaitskell as Minister of Fuel and Power in succession to Mr. Shinwell inspired fresh confidence in the fuel industries. Transactions in gas shares, though fewer in number, were on a higher level, and for the first time for many months the whole of the price changes compared with the previous week were in an upward direction, after some fluctuations during the week. Rises and falls were as follows:

OFFICIAL LIST

Bournemouth, 6 p.c. pref. ...	122	—127	+ 2
British Gas Light, ord. (xd. Oct. 1)	117	—122	+ 2
Gas Light & Coke, ord.	21/	—23/	+ 1/3
Do. 3 p.c. con. deb. ...	82	— 87	+ 1
South Eastern Gas Corp., 4½ p.c. red. cum.	19/-	— 21/-	+ 6d.
Uxbridge, &c. 5 p.c. pref. ...	105	—115	+ 12
Wandsworth, cons.	105	—115	+ 13

GAS PRODUCTS PRICES

The London Market

October 10

There are no changes to report in the prices of coal tar products.

The Provinces

October 10

Average prices for gas-works products this week are: Pitch, 75s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6¾d. per gall.; pure, 3s. 2¼d. Prices for carbolic acid 60's anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.) and strained anthracene oil are controlled by Government Orders. Prices for road tar are increased by one penny per gall. by S. R. & O. 1947, 177.

Scotland

October 11

Market continues active, with prices unchanged.

Refined tar.* Yield to the distiller is 6d. per gall. ex works, naked. Creosote oil. Timber preserving quality,* 5½d. to 6½d. per gall.; hydrogenation oil,* 5¾d. per gall.; low gravity or virgin oil,† 7½d. to 7½d. per gall.; benzol absorbing oil, 6½d. to 8d. per gall. Refined cresylic acid is 3s. 6d. to 4s. 6d. per gall. ex works, naked, according to quality. Crude naphtha,† 8d. to 10d. per gall. Solvent naphtha.* Basic maximum prices delivered in bulk, 90/160 grade 2s. 10d. per gall, and 90/190 heavy naphtha, unrectified 2s. 0½d. per gall, rectified 2s. 4d. per gall. Pyridine, †90/160 grade 15s. per gall., and 90/140 grade 17s. per gall.

* Price controlled. † Uncontrolled.